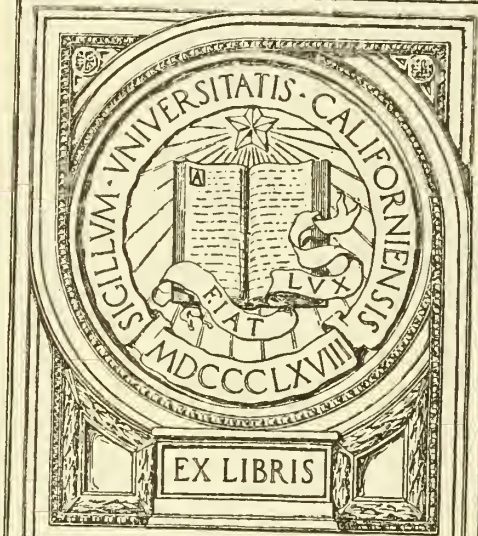
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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society

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VOL. XIII JANUARY, 1930 No. 1

THE ADVANCING KNOWLEDGE OF SPINAL ANESTHESIA

DANIEL H. BESSESEN, M.D.
Minneapolis

THE use of spinal anesthesia on the head, neck and thorax has been so entirely contrary to our former interpretation of the action of spinal anesthesia, that the established theories of the action of novocaine on the spinal and nerve tissues must be removed before it can be considered safe to administer this form of anesthesia on the higher regions of the body. The mere fact that the novocaine may be introduced into the spinal canal and in any one case produce general anesthesia without death is sufficient to demand explanation if we are to cling to older hypotheses.

It was formerly thought that respiratory and cardiac paralyses were responsible for deaths from this form of anesthesia. This, we now know, is not the case. Deaths which result from subarachnoid nerve blocks are due to cerebral anemia from fall in blood pressure and may be prevented by the Trendelenburg position. Even if no fluids are injected to bring the blood pressure back to normal, the pressure is found to rise again on change of position in those few cases (5 per cent) in which it falls to dangerous levels to within ten or twenty millimeters of the former level measured before the introduction of anesthesia.

To properly explain this action, let us review the studies made on the effect of novocaine on sensory and motor nerves. These indicate that motor nerves are not affected by novocaine in the dilution required to deaden sensory nerves. It is true that sensory stimuli aid in maintaining circulation and respiration, but there is sufficient automaticity in these functions to keep them operating in the absence of sensory stimuli. The distribution of novocaine over the sensory nerves of the entire head, neck and thorax may put the and respiration, if the blood pressure is high patient to sleep but will maintain the circulation enough to nourish the upper nerve centers.

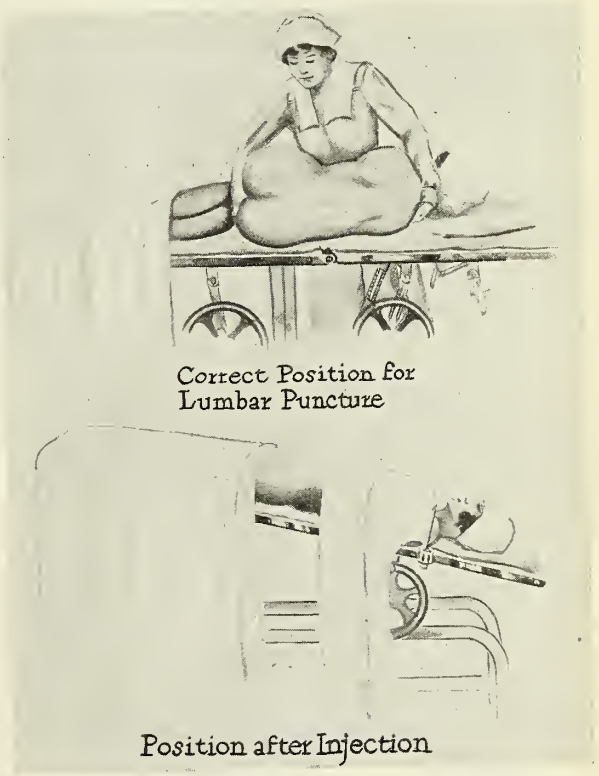


Fig. 1. The position illustrated in the upper drawing is that permitting the greatest ease in performing lumbar puncture. After withdrawing spinal fluid and reinjecting the anesthetic, the patient is placed in the position illustrated in the lower drawing.

When one adds to these physiologic explanations, the anatomic fact that the ligamentum denticulatum divides the posterior (sensory) portion of the spinal canal from the anterior

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(motor) portion and that it is into the posterior (sensory) portion that the novocain is injected, it becomes more comprehensible how spinal anesthesia may be applied to the upper portions of the body without danger of death.

The diaphragm is no longer accepted as the upper level of safe spinal anesthesia. The blood pressure is no longer taken as the index of the safety margin of the patient. We are coming more and more to rely on Labat's statement that the safety of spinal anesthesia rests on the Trendelenburg position alone, has nothing to do with the distribution of the novocaine in the nerve centers and need not require more than passing attention to the blood pressure.

The contraindications for the use of this anesthetic are being limited to cerebral disease, infections which may contaminate the spinal puncture and conditions prohibiting the use of Trendelenburg position.

While this advancing work and these changing interpretations broaden the scope of spinal anesthesia and make more comprehensible its application to all fields of the body, we must remember that the use of these methods requires expert care and attention. We must learn to accept these changes in physiologic knowledge and realize that in this way we are approaching a standardization of novocaine nerve block more nearly ideal. There still remain the numerous advantages of spinal anesthesia, but we must not be fanatic in its application to all cases regardless of circumstances—because we must bear in mind that the patient comes to us to get well. Therefore, the best technic and the proper methods suitable to that particular case are the ones to select for administration.

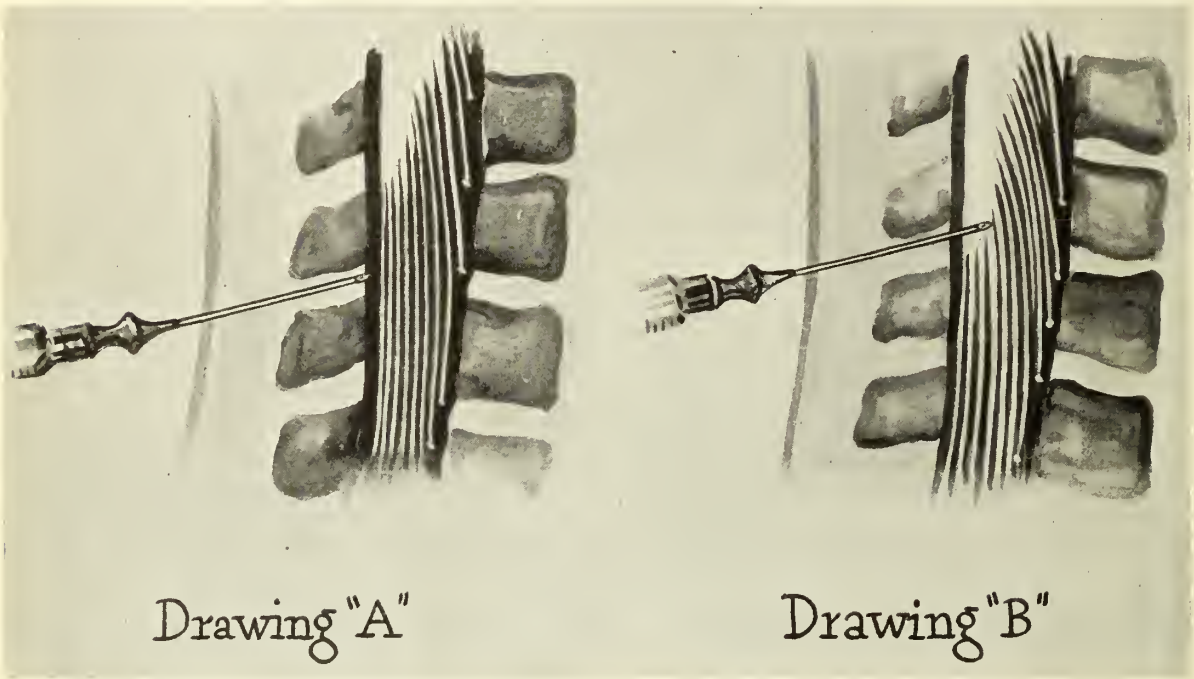


Fig. 2. In drawing "A" is shown the commonest error in technic—the needle is half in and half out of the dura. The spinal fluid will flow out, but the anesthetic will not usually pass into the dural canal.
Drawing "B" illustrates the better placement of the needle, well into the spinal canal. Properly, the bevel of the needle should be within the dura, posterior to the ligamentum denticulatum, thus allowing the novocaine to come in direct contact with the sensory nerve roots.

The technic of spinal anesthesia is departing from stock solutions and from solutions of lighter or heavier specific gravity than the spinal fluid. The best procedure is that described by Evans—the dissolving and reinjecting of one to two and a half decigrams of novocaine in four to eight cubic centimeters of spinal fluid into the spinal canal. The amount of drug and the volume of spinal fluid determine the level of anesthesia. With the larger dosages, the level will rise higher and the length of anesthesia be slightly longer; with larger volume, a wider distribution will be obtained.

The duration of anesthesia still remains at

approximately 60-90 minutes and is suitable for most operations of that expected length of time. The relaxation of muscles and relative bloodlessness of the field make the operative technic much more rapid than under any other form of anesthesia.

These advances in our present knowledge of spinal anesthesia are being heralded with enthusiasm by many of the outstanding surgeons of the world. We can only stand in awe at the marvels of nature as applied to surgical maneuvers.

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DR. FLORENCE RENA SABIN WINS AWARD

To that large and constantly increasing number of women seeking professional careers, the announcement by Pictorial Review that the winner of its annual Achievement Award of $5,000 for the year 1928 is Dr. Florence Rena Sabin, fellow of Johns Hopkins University, and member of the staff of the Rockefeller Institute for Medical Research, will prove encouraging.

This award, which is now in its seventh year, is made annually to the American woman, by birth or naturalization, who, in the opinion of a distinguished committee, has made the most distinctive contribution of the preceding year to the fields of American art, science, or letters.

Dr. Sabin has received it for her splendid contributions to mdical science, which include a complete study of the nerve-centers; the discovery of the origin and processes of the lymphatic system; the discovery of the development and processes of the blood-cell; the discovery of the functions of the monocyte, the white blood-cell which bears so directly upon the study of the tubercle bacillus and its effect on the human system.

These discoveries were made by Dr. Sabin in her own original research. Working with her associates, she had also had much to do with the analysis of the tubercle bacillus, and with the research work that is going forward toward a complete cure for this destroyer of the human tissues.

But what is most interesting to the women of to-day is that Dr. Sabin, by her genius and her concentration to her high purpose, has made it easier for all women who wish to enter the field of science with the hope that they, too, may some day reach the apex of achievement. It is an established truth that a way once hewn is easier for those who would follow after. Where one has been it is easier for others to venture. And Dr. Sabin's career has been a series of first adventures for women.

She was the first woman to be admitted and to graduate from Johns Hopkins Medical University. She was the first woman to be admitted as an intern in the Johns Hopkins Hospital. She was the first woman to be a member of its staff. She was the first woman to be a member of the teaching staff of Johns Hopkins Medical University, where she was professor of histology. She was the first American woman to be admitted to European research laboratories, working side by side with men in Italy and in the laboratories of Leipzig and Heidelberg. She was the first and is yet, to-day, the only woman to be made a member of our National Academy of Science, and was also the first woman to become a member of the Rockefeller Institute for Medical Research.

By the steady, quiet force of her ability for original work, her consecration to that work, she has won her way to a position in the world of science second to few men. Dr. Simon Flexner, president of the Rockefeller Institute, declares her to be the greatest living woman scientist and one of the foremost scientists of all time.

Dr. Sabin is the sixth American woman whose name has been added to the roster of Pictorial Review's Hall of Fame for Women. Previous awards have been made to Mrs. Edward MacDowell, for her work in establishing at Peterboro, N. H., a colony where artists may go to work in felicitous surroundings at small cost; to Mrs. Cora Wilson Stewart, for the establishment of the Moonlight Schools in the Southern mountains, where thousands of American men and women have been brought out of the darkness of illiteracy; to Miss Sara Graham-Mulhall, who has accomplished much toward the restrictions of the drug traffic in this country; to Miss Eva Gallienne, for founding the Civic Repertory Theater in New York, whereby the entire country has been stimulated to the need for good drama at a price that all can afford; to Miss Martha Berry, who established and maintained the Berry Schools at Rome, Ga., where over two thousand boys and girls of the Southern rural districts have been able to work their way to an education that would have otherwise been denied them.

The members of the Award Committee are: Senator Arthur Capper of Kansas, Mr. Otto H. Kahn of New York, Mrs. Mary Roberts Rinehart, Mr. Clark Howell of the Atlanta Constitution, Miss Ida Tarbell, Miss Mary Woolley, president of Mt. Holyoke University; ex-Senator James D. Phelan of San Francisco, Mr. Augustus O. Thomas, president of the World Conference on Education; Mr. Carl Sandburg, Mr. John Farrar, literary editor; Mrs. Charlotte Perkins Gilman, Madam Louise Homer, Dr. Henry Goddard Leach, editor The Forum; Mr. Edwin Markham, Mrs. Henry W. Peabody, Mrs. Edith Nourse Rogers, member of the House of Representatives; Mrs. John F. Sippel, president of the General Federation of Women's Clubs, and Mr. Walter L. Clark.

SPINAL ANESTHESIA*

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IT is believed that spinal anesthesia, like many great discoveries, resulted from an accident. Dr. J. L. Corning, of New York City, in 1885 produced temporary motor and sensory paralysis of the lower extremities while giving a therapeutic extraspinal injection of cocain. In 1891 Quincke established lumbar puncture as a diagnostic and therapeutic procedure. In 1899 Bier published the results of eight anesthesias which he had practised upon himself, his assistant and six patients. In spite of Bier's warning, this discovery was followed by widespread use. Spinal anesthesia was then soon abandoned due to the poor results occasioned by a lack of understanding of its very definite indications, contraindications and technic.

No method of anesthesia yet discovered has had such a rocky course as the spinal method, and it is my opinion that it is not thus far firmly established. Its long history of use and disuse is in marked contrast with the short, rather stable history of ethylene gas. This can all be explained by: (1) the fact that novocain though discovered in 1904 was not recognized generally as the safest intradural drug until a comparative study was made by Cary Eggleston and Robert A. Hatcher in 1919; (2) that the physiology involved in the sudden drop of blood pressure was not understood and therefore the drop could not be prevented. Even today many surgeons have not been convinced of the superiority of novocain.

Wayne Babcock,[1] of Philadelphia, has been one of the greatest proponents of lumbar anesthesia, both in experimental and clinical work, in this country. In 1911 he reported the results of 350 inductions, and in February, 1926, he recorded the results of over 20,000 inductions. In many European clinics the method is used extensively. Dr. B. Koch, Professor of Surgery at the University of Bratislava, with whom I worked for a short time, had used it in a series of over 6,000 cases and as is the case with Babcock, in 90 per cent of his operations below the diaphragm. At the present time it is used throughout the United States by many surgeons. It is our opinion that several years must elapse before its comparative value as an anesthetic will be determined. In the following review you will note that the indications, contraindications and the technic are very definite. One can blame a death under general anesthesia upon the drug, but under spinal anesthesia a mortality is usually to be blamed upon the surgeon (Babcock[1]).

The known indications may be classified as follows:

(a) *General*

1. Operations below diaphragm only, preferably below the umbilicus (Labat[7]), (Meeker[8]).
2. Age limits. Meeker states that children under sixteen years of age are usually not suitable subjects. Senility associated with debility calls for decreased dosage and often it is advisable to use a local anesthetic where degeneration of the vital organs is evident.
3. Systolic blood pressure must be over 100.
4. When general or local anesthesia cannot be used for any reason and this form is not contraindicated.
5. For diagnostic purposes when muscular relaxation allows more accurate localization.

(b) *Special*

1. Acute abdominal infections such as appendicitis, perforated gastric or duodenal ulcer or obstructive ileus.
2. Cases with high blood pressure not showing marked myocardial changes. Spinal anesthesia should be avoided unless sure of the heart.
3. Cases in which a general anesthetic is dangerous. (I have in mind a patient with chronic bronchitis, marked rectal prolapse, extreme toxemia from gangrene below the middle of the thigh, who under spinal anesthesia made an uneventful recovery following high amputation.)
4. Patients with renal dysfunction, high blood urea, albumin or casts.
5. Cases of acute or chronic respiratory infection. (We have operated several of these successfully.)

*Read before the annual meeting of the Interurban Academy of Medicine, Superior, Wisconsin, November 20, 1929.

6. In the field of operative obstetrics, including cesarean section (Pitkin[9]).

7. In many general diseases including diabetes, pneumonia, tuberculosis, eclampsia, complicating surgical conditions.

8. Operations such as prostatectomies, amputations, hernias, in suitable subjects. (We have used it often in reducing strangulated hernias.)

Contraindications:

Generally speaking, this form of anesthesia is contraindicated in shock, depression or hypotension from any cause. The failures are probably due in most cases to an unwise selection of the patient, the drug, the dosage or technic (Evans[4]).

Specifically, the contraindications may be listed as follows:

1. Cardiac embarrassment from any cause.

2. Mechanical limitation of the respiratory space (fluid).

3. Organic involvement of the cerebrospinal nervous system, such as brain tumor, intraspinal hemorrhage, cord tumor, or meningeal involvement.

4. Patients having great abdominal distention, marked jaundice, or extreme obesity are poor anesthetic risks. They are unable usually to withstand a sharp fall in blood pressure. Local anesthesia is here preferred.

5. Septicemia with positive blood culture.

6. Suppuration at site of puncture.

The greatest advantage of spinal anesthesia is in its application in some emergency operations where there has been no time for adequate preparation. I recently operated for a perforated duodenal ulcer. The patient also had a marked bronchiectasis. By using intravenous saline and adrenalin to combat the shock we were able to administer spinal anesthesia successfully. We did not use local anesthesia because the patient was apprehensive and complete relaxation was necessary.

The complete muscular relaxation facilitates the operative work. When properly administered there is very little metabolic disturbance or interference with the normal functioning of the heart, lungs, kidneys and intestines. Nourishment can be given following operation. It has been stated that post-operative gas pains are less noticeable. This has not been our experience. We, however, believe that post-operative shock is less.

The greatest disadvantage of this form of anesthesia is the too frequent appearance of danger signals during the anethesia. When the vasoconstrictors give way it is with a suddeness that is distracting to the operator. Even after carefully selecting the subject it is not always possible to know in which case the symptoms of collapse with pallor, sweating, distress, respiratory and cardiac failure will occur. The fact that the dose once injected cannot be recalled or prevented from acting and that the patient's life so closely depends upon the accuracy of dosage and skill of the surgeon, certainly should limit the indiscriminate employment of spinal anesthesia. After all, the one real disadvantage in this method of administration is that the anesthetic cannot be administered gradually until the stage of surgical anethesia is reached. The full dose must be administered at one time (Meeker[8]).

Mentally unstable patients are very apprehensive; they are not of the "local type." If the operation is to be prolonged, haste may lead to error. Hemorrhage has resulted from imperfect hemostasis due to the anemia at the site of operation accompanying the fall in blood pressure. Headache occurs occasionally. It may result from a decreased intraspinal pressure due to a leak at the puncture site (Pitkin[9]), an increased pressure (Jackson[5]) or to the presence of chemical agents in the needle or syringe incident to sterilization, which are injected into the lumbar sac, where they serve as irritants. It is a well known fact that headaches occur frequently following diagnostic lumbar puncture as well as after the injection of sera for the treatment of meningeal disease. Ocular palsies and meningeal infection are mentioned in the literature but we have not observed them.

It is important therefore that before using intradural injection one should understand the physiology and technic involved.

The physiological action of the drug depends upon the nerve roots involved and the extent of their involvement. When the drug is injected the feet and perineum are first affected. As the drug spreads, the anesthesia extends up the legs and body to a level corresponding to the highest nerve roots affected. The posterior or sensory roots are more completely anesthetized than the anterior. The drug also diffuses more readily over the posterior than over the anterior roots. Any anesthetic to be successful should produce

two effects, namely, loss of pain combined with muscular relaxation. The first is essential for the operation; the second is desirable that the operation may be done with greater facility.

To repeat, the physiology of intradural anesthesia is that of a transient root interruption, chiefly affecting the posterior roots, causing loss of tactile, muscle, and temperature sense. The anterior roots are also blocked, causing a temporary motor paralysis. The anterior root block affects also the white rami communicantes. This is the most unfavorable and hazardous action of the drug because it causes a temporary vasomotor paralysis. Babcock aptly states that for animals which sit or stand erect a vasoconstrictor system is essential. A snake has no vasomotor system, and when suspended by the head may suffer and finally die from failure of blood to ascend to the heart. A high spinal anesthesia produces the same condition when the head is raised or even placed on a level with the rest of the body. The white rami are associated with the anterior roots from the second thoracic to the third lumbar roots. Obviously, if only the lower lumbar and sacral roots are affected there will be very little effect on the blood pressure. However, if the higher roots supplying the great splanchnic vessels or those above are anesthetized, there will be a marked drop in blood pressure usually lasting from fifteen to thirty minutes (Babcock[1]).

It is evident that a precise technic must be followed in order to obtain the maximum efficiency with a minimum of danger. This will conveniently be divided into preoperative, operative and postoperative stages.

Our preoperative procedure is to give two allonal tables (each 2⅔ gr.) one hour before operation. Experimental study shows that barbital is a very definite antidote to novocain poisoning. This drug is therefore used routinely by many surgeons instead of allonal, 10 grs. being given (Kelly[6]). However, the novocain is used in such small amounts that toxic effects are rarely noted. We have not encountered novocain poisoning in over fifty cases and there is no record of its occurrence up to the present time at St. Luke's Hospital. One half hour before going to the operating room, the patient is given morphine gr. ¼ and atropine gr. 1/150 hypodermically. It is important that sedatives be administered in sufficient amount to counteract the fear accompanying the spinal anesthesia.

Minor preoperative details may be summed up as follows: An enema should be given at least three hours before operation and in rectal and gynecological work it is important that this interval be longer. The eyes should be covered. The patient should be taught to breathe deeply to combat nausea during operation. He is allowed to eat a light supper, but on the morning of the operation we prefer an empty stomach for two reasons: (1) because the nausea during operation may be accompanied by vomiting; (2) this form of anesthesia must often be supplemented by a general anesthetic.

Just before operation the blood pressure is recorded. Ephedrine is given hypodermically, usually 50 mgms. of the hydrochloride at the time of spinal puncture. It may be used with the novocain locally prior to puncture. The height of puncture is determined by the site of operation, the first lumbar space being used for upper abdominal, and lower lumbar spaces for operations at lower levels. Many operators lower the head of the table until the desired anesthetic level is reached. Novocain is put up in ampoules of 50-100 mgms. and we usually determine the dosage on the basis of 10 mgms. of drug to every 10 pounds of body weight. For higher anesthesia and more prolonged action more drug is needed, occasionally 200 mgms. being given in gallbladder and stomach surgery. We rarely use more.

A small Pitkin needle (gauge .22) is used to prevent leakage of spinal fluid at the site of puncture after induction. We do the puncture more readily in the sitting position, although with the patient on the side it is easier and quicker to turn him on his back and place him in the proper position for operation. The head of the table is lowered about 15 degrees. (Pitkin has devised a Tiltometer especially adapted to his method of spinocain induction.) During the operation the blood pressure is recorded every five minutes. If the systolic pressure goes below 60 we give 10 min. of adrenalin hydrochloride (1:1000) intramuscularly; if it drops below 40 or the pulse becomes imperceptible, or shallow respirations are noted, normal saline containing one drop of adrenalin to every 100 c.c. is given intravenously. It is important that this apparatus be always at hand and that if it requires

more than three minutes from the time the order is given to administer it, the technic is unsafe. According to Babcock[1] the brain degenerates and the patient's condition is hopeless if the circulation stops for 7 minutes or more. According to Meeker[6] cessation of heart action is always fatal if it persists a very few minutes. Therefore one can understand the importance of the rapid intravenous injection of normal saline with adrenalin.

We have observed the drop in blood pressure in twenty-five cases and found that in only six was there a drop of 30 points or more in the systolic pressure. Further, this drop occurred in the first five minutes after induction. A 30 point drop in the first five minutes was followed by a further drop in five of the six cases in the succeeding readings at ten and fifteen minutes after induction. In two cases the pressure dropped to zero at the five minute interval and remained so throughout the ten and fifteen minute periods. All of the six cases received adrenalin and four of them were given adrenalin plus intravenous saline. One patient died on the table. This patient was in extremis—a neglected appendix with pneumonia, paralytic ileus, and general peritonitis. He would not allow local, could not stand general anesthesia, and due to distention we could not diagnose the case without the relaxation that spinal induction afforded. I have personally seen three deaths under spinal anesthesia and have recently been told of others. It is well to remember, as I have said before, that if a drop occurs it is sudden and that it is almost always apparent in the first five minutes following induction.

After operation the patient should be moved very gently, never raising the head or body. The foot of the bed should be elevated for the first 24 hours on his return to the room. He should be watched closely for the first hour. Except where the operation itself or the condition of the patient contraindicates it, liquids may be given. Morphine is given for pain.

Postoperative complications were few. In twenty-five consecutive cases paralytic ileus was noted in one; pneumonia in one; immediate headaches in two; headaches after one week in four; vomiting in six cases.

Spinal anesthesia is now being frequently induced at St. Luke's Hospital. Since our first induction on August 6, 1928, until September 14, 1929, it has been used 168 times by eighteen surgeons in operations on the abdomen and lower extremities. In several cases anesthesia was incomplete. Competent observers state that it fails in 1 to 6 per cent of cases (Sise[10]). We have used it successfully in most major operations in the abdomen, pelvis, and on the lower extremities. We do not select it to the exclusion of other anesthetics, using it in approximately one out of every five operations. We rarely use it in upper abdominal surgery. It has a definite field of usefulness, but I believe it should be restricted: (1) to major operations; (2) preferably to those below the umbilicus; (3) to patients physically able to react from the drop in blood pressure.

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SOME RECENT ADVANCES IN ENDOCRINOLOGY*

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In the first quarter of this century more discoveries pertaining to the glands of internal secretion have been made than in any other period. Among these may be mentioned the isolation of thyroxine and epinephrine, the discovery of insulin, the isolation of the parathyroid and ovarian hormones, complete revision of knowledge of the pituitary gland, and many notable studies on the suprarenal bodies. Each of these discoveries has stimulated clinical research and has vastly increased both the diagnostic and therapeutic facilities of the physician.

It is my purpose to review here briefly some of the more recent endocrinologic studies and to discuss their clinical applications. The principal reason for such a review is that much of the work concerned is still in the experimental stage and is not generally known to the profession. It may be useful, also, as a sort of antidote to the literature on endocrinology with which some of the unethical pharmaceutical houses have circularized physicians. Perhaps at least 50 per cent of treatment by endocrines as applied today is fundamentally unsound from a scientific standpoint. In spite of rapidly increasing knowledge, this therapeutic field is still limited and can be extended only by painstaking and accurate studies. Understanding of the physiologic and pharmacologic activities of the various hormones recently isolated is of much value in developing conservative and scientifically correct methods of treatment.

PITUITARY GLAND

Among the most interesting studies of the last few years have been those dealing with the pituitary body. This gland has been the object of scientific curiosity since the earliest times. Ancient physicians held the theory that it was an excretory gland for the brain and that certain noxious materials were passed through the gland into the nose or pharynx. Its functions were practically unknown until Marie (1886) described the condition now known as acromegaly, and Minkowski (1887) suggested that this disorder was the result of disease of the pituitary gland. The development of knowledge in regard to the pituitary gland has gone forward steadily since Marie's work. Those interested in the progress are referred to the writings of Biedl, Swale, Vincent, Abel, Geiling and Evans. It suffices to say that the pituitary body is no longer regarded as a single glandular structure, but rather as a group of independent structures which elaborate at least four and possibly more hormones of very different natures and properties.

Physicians are indebted to Herring and his studies in comparative anatomy and embryology for present conceptions of the anatomy of the gland. It consists of four portions: the anterior lobe, glandular in structure and the source of a hormone which has a powerful effect on growth; the intermediate lobe, which invests the posterior portion of the gland and extends up the stalk; the posterior lobe, which is the source of the substance known by the trade name of pituitrin, and another epithelial lobe, the pars tuberalis, which surrounds the infundibulum and spreads out under the floor of the brain. The functions of this last portion of the gland are unknown, but it is undoubtedly of great importance to the organism, since experimental injury to it may be responsible for marked adiposity, disturbances of water metabolism, and so forth. The function of the intermediate lobe is likewise uncertain, although Atwell and Marinus, and others, have suggested that it may be the source of the hormone of the posterior lobe or of some precursor of it. The posterior lobe, according to this theory, may be a place for storage of pituitrin or conversion of these precursor substances.

Anterior lobe.—Only one portion of the pituitary body, the anterior lobe, seems to be essential to life; work on extracts of this portion of the gland has been carried on for some time, and a number of highly contradictory results have been reported. One of the first workers to report significant results was Robertson, who isolated a growth-stimulating substance which he

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Northern Minnesota Medical Association, Bemidji, Minnesota, September 2 to 3, 1929.

called "tethelin." Since the publication of his work, many other extracts of the anterior lobe have been studied, but only recently has the problem of secretion of the anterior lobe been solved, chiefly through the efforts of Evans and Long. They have been able to prepare an extract of the anterior lobe, which on parenteral injection powerfully stimulates growth. They have obtained marked acceleration of growth in rats by the use of this substance; some of these animals will more than double their weight on this type of treatment. Extracts of this sort also will counteract the changes which appear in tadpoles after removal of the anterior portion of the gland. In their original work, Evans and Long described inhibition of estrum by means of these extracts. It is now known that these earlier results can be explained by the presence of substances other than the growth-stimulating principle. In an article published in 1928 Evans and Simpson claimed to have demonstrated the presence of two hormones of the anterior lobe: one is required for normal growth and development and the other for the development of the gonads, thyroid gland and suprarenal cortex. The effects of the second hormone on the gonads can be practically nullified by simultaneous administration of the substance that effects growth. They suggested that there is very exact adjustment of these hormones in early life in order that growth may be accomplished before the attainment of sexual maturity. They also suggested that the hormone of growth is derived from the eosinophilic cells of the gland and the gonadal stimulant from the basophilic cells.

Putnam, Teel and Benedict have carried this investigation a step further by their work on dogs. They have been able to prepare a pure and more concentrated extract of the bovine anterior lobe, which produces experimental acromegaly in dogs. Their animals gain rapidly in weight when treated with this substance, and definite overgrowth of the bones and viscera takes place. The animals have many of the characteristics of the acromegalic subject; in some, the huge extremities, clumsy gait, and decreased muscular activity are striking. Clinical studies indicate that this extract of the anterior lobe may be of value in the treatment of pituitary insufficiency in the human subject; an attempt to use the substance in the treatment of infantilism is now being made.

Posterior lobe.—The posterior lobe of the gland has long been known to be the source of an extract which is in every-day medical use and which has powerful pharmacodynamic properties. These are so well known that repetition is almost unnecessary. The extract of the posterior lobe, designated pituitrin, has the property of raising blood pressure, as shown first by Oliver and Schäfer, and Howell, of causing a powerful contraction of smooth muscle, particularly that of the uterus, and of having both diuretic and antidiuretic effects. It also affects the chromatic function of amphibians and has the definite property of raising the level of blood sugar. It has been assumed for years that these various properties were each due to individual hormones, although the unitarian theory had also had its strong adherents. The matter appeared to be settled when Abel and his associates,[2] in 1923, prepared from the pituitary gland a highly purified tartrate which possessed all the properties of commercial pituitrin. This salt was one of the most active and potent substances ever isolated; it had oxytocic properties more than 1,500 times as great as an equal quantity of histamine.

Recently, a group of investigators[27] in the laboratory of Parke, Davis and Company has demonstrated that there were two active principles in the posterior lobe. One of these, alpha-hypophamine, possesses the property of causing smooth muscle to contract; the other, beta-hypophamine, contains the pressor and the diuretic and antidiuretic principles. Both of these substances are basic bodies, presumably amines; they may be combined to form a mixture which has all the properties of ordinary pituitrin. These two substances have been prepared under the trade name of "oxytocin" and "vasopressin" and, through the courtesy of the original workers, my colleagues and I have been supplied with material for experimental and clinical study.

Kamm and his associates[27] have found that oxytocin has few properties other than its effect on smooth muscle. At the clinic we have had a similar experience, and have found oxytocin not to have any action on blood pressure, cardiac rate, urinary output or heat production. It causes elevation of the blood sugar when given in large doses, but its effect in this connection is considerably less striking than that of vasopressin, and may be due to the small amount of pressor substance which cannot be completely sep-

arated from the oxytocic fraction. This pressor substance resembles epinephrine in many respects, but on chemical examination it does not give a positive phenol ring test such as is characteristic of epinephrine. The original workers showed that it had a powerful pressor effect, and that in subjects to which it was administered tolerance of pressor activity would develop similar to the tolerance of patients to pituitary preparations. They have also shown that vasopressin contains the diuretic property of pituitary extracts, and also that it has antidiuretic properties. It was found that it has, like epinephrine, the power of raising the level of blood sugar and of partially neutralizing or overcoming the effects of insulin. These effects are not pronounced, and large doses are required to secure them. Unlike epinephrine, it does not exert a calorigenic effect, but rather depresses production of heat. The experiments demonstrating this were performed by Wilhelmj, who believes that the transient drop in metabolism that is observed is best explained on the basis of widespread vasoconstriction. The clinical results obtained with vasopressin and oxytocin are of great interest, but probably the greatest advance which the work of Kamm and his associates represents is along the lines of more exact physiologic knowledge of pituitary activity.

Clinical value of pituitary substances.—The clinical use of these recently isolated pituitary extracts is still in the experimental stage. The growth-stimulating hormone from the anterior lobe which investigators at Harvard are now using, is not as yet sufficiently purified to be available for general use in the human subject. It promises to be of great value in pituitary types of infantilism and in pituitary insufficiency produced by the sugical removal of tumors. Its exact status in the treatment of other pituitary disease is still uncertain. These experimental extracts appear to be the only principles of the anterior lobe which have any clinical value at present. The substance of the anterior lobe which is now sold for oral administration is probably inert, and careful testing of the hypodermic preparations of principles from the anterior lobe, now on the market, has been done with negative results. It is probable that the weight-reducing effects obtained by oral administration of dried substances of the anterior lobe may be due to the presence of certain amines which increase the specific dynamic action of protein foods.[3, 28]

Any further consideration of the therapeutic use of extracts of the posterior lobe is unnecessary because of the wide experience of the medical profession with pituitrin. The advantages

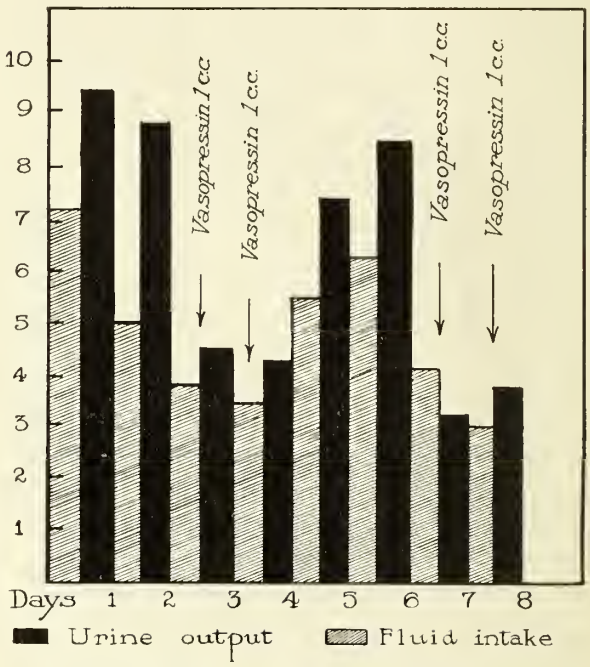


Fig. 1. The effect of vasopressin in diabetes insipidus.

of having the oxytocic and pressor functions in separate preparations is obvious. Oxytocin, or, as it has been renamed, "pitocin," is fully as effective for obstetric use as pituitrin and has the advantage of not elevating the blood pressure.[43] Vasopressin, or "pitressin," is of value for its pressor effects and is extraordinarily efficient in controlling the polyuria of diabetes insipidus (Fig. 1). The pressor principle has some other effects which are of great clinical interest. After operations on the pituitary body, shock may ensue, and there may be abrupt rises in temperature (hypothalamic fever), which cannot be attributed to infection. Vasopressin has been shown by Learmonth to have a definite effect on the abnormalities of heat regulation following operations on the pituitary body. He has demonstrated the beneficial effect of this substance on the blood pressure after such operations. Snell and Rowntree have found it to be of some value as an emergency stimulant in Addison's disease.

METABOLISM OF CALCIUM; THE PARATHYROID GLANDS

The second advance in endocrinology, which I wish to consider, is that which pertains to the regulation of metabolism of calcium. The interest in this field is chiefly due to the recent preparation of active parathyroid extracts which will cause elevation of the calcium of the blood serum. Before commenting on the effects of this extract, a brief statement of the knowledge of metabolism of calcium is necessary. For a more complete account, the reader is referred to Stewart and Percival's recent reviews.[52, 53] An adult requires about 0.4 gm. of calcium a day; a growing child, from three to four times as much. It is absorbed chiefly from the small intestine and is excreted into the colon. Two factors seem to govern the rate of its absorption: the presence of an adequate supply of vitamin D, and gastric acidity. The action of acid can be explained by the fact that it changes organic combinations of calcium into inorganic forms that are more readily absorbed. Calcium probably is excreted chiefly through the bowel, but, because large quantities of calcium pass through the intestinal tract unchanged, the daily rate of excretion is difficult to determine. Soluble forms of calcium are excreted in the urine in amounts of about 0.4 gm. a day in men and in smaller quantities in women. The principal function of calcium is, of course, in the formation of bone, but it is also necessary for the coagulation of blood and for the maintenance of a proper environment for living cells. The relation of the parathyroid glands to metabolism of calcium has only recently been recognized, although the glands were discovered by Sandström in 1880 and the condition of tetany which follows the removal of the parathyroid glands has long been appreciated.

McCallum and Voegtlin (1908 and 1909) demonstrated that after parathyroidectomy the blood calcium was decreased and that intravenous injection of calcium salts relieved the symptoms of tetany thus produced. Fourteen years later, their work was fully corroborated by Salvesen, who stated: "The symptoms of parathyroid insufficiency are due to calcium deficiency. The parathyroids control the calcium level of the blood and by doing so they influence the function not only of the muscles and nerve tissues but probably of all the organs."

Shortly afterward, Hanson, Collip and Berman, working independently, prepared extracts of the parathyroid gland which not only controlled the symptoms of tetany but which were capable of causing elevation of calcium of the blood serum in normal animals. Collip,[11, 12]

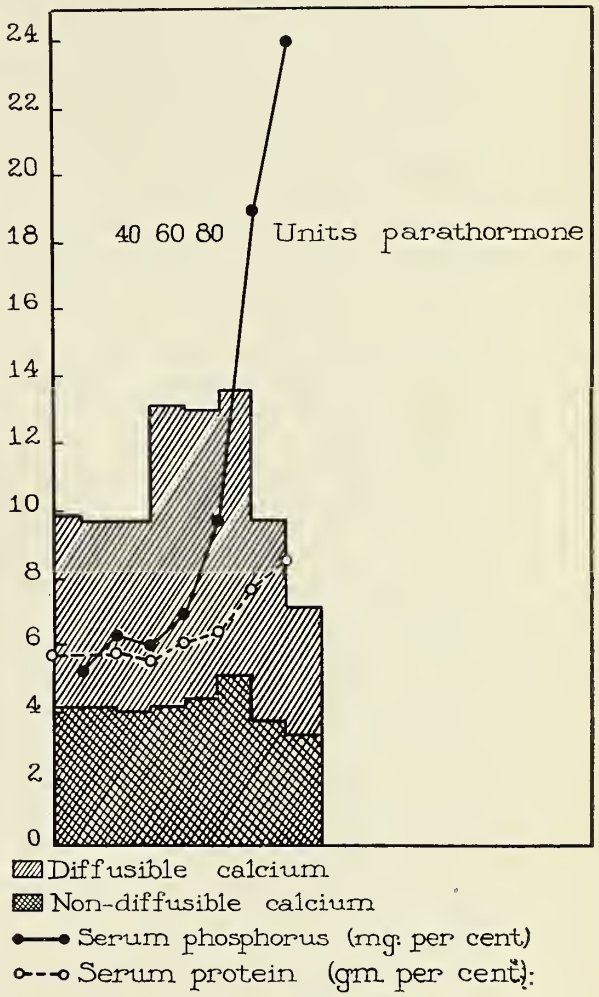


Fig. 2. Hypercalcemia.

whose work overshadows that of other investigators in this field, also demonstrated that if the parathyroid hormone was administered continuously in large doses, the blood calcium could be increased to double the normal amount; if treatment were continued, the blood phosphorus eventually rose and the nitrogenous constituents of the blood were greatly increased; the blood also became greatly concentrated. This condition, which is known as hypercalcemia (Fig. 2), may be fatal unless the use of parathyroid extract is discontinued.

During the administration of the parathyroid

hormone, there is a greatly increased excretion of calcium, which presumably comes directly from the bones. It is theoretically possible to decalcify the skeleton by the use of this substance, and there is no doubt that long-continued use may lead to definite skeletal defects. The best evidence on this point is given by the recent work on hyperparathyroidism. Barr, Bulger, and Dixon recently have described a case of hyperparathyroidism in which a parathyroid adenoma was present. The over-supply of parathyroid hormone thus produced leads to rarefaction of bone, to multiple cystic tumors of bones, muscular weakness, hypotonia, formation of calcium stones in the urinary tract, and abnormally high levels of calcium in the blood and urine. Removal of the parathyroid adenoma in this case, as well as in the cases recently reported by Wilder, and Stearns and Boyd, resulted in reduction of the blood calcium to the normal level, striking decrease in excretion of calcium and great improvement in the condition of the patient.

A word as to the mechanism by which the parathyroid hormone exerts its normal function is perhaps desirable, although the subject is not as yet fully understood. The blood serum is supersaturated with calcium phosphate, and much calcium can be removed from it by shaking with dry calcium phosphate.[23] This supersaturation is brought about by a series of equilibriums between diffusible and nondiffusible forms of calcium. About 50 per cent of the calcium of the blood serum is in combination with the serum proteins and cannot be removed by diffusion. There is also a freely diffusible and ionized portion, probably consisting of inorganic calcium salts. A third portion, nonionized, but diffusible also, exists, and probably represents the portion which is directly influenced by the parathyroid hormone.[9] The presence of a nondiffusible portion of blood calcium obviously explains why calcium does not entirely disappear from the blood after parathyroidectomy and also explains the low blood calcium encountered in nephrosis, kala-azar and other diseases in which there is a deficiency in serum protein. In these diseases, tetany is rare, although the blood calcium will reach the level observed in tetany. This seems to indicate that the diffusible portion of the calcium is that which protects the organism against tetany. There is evidence to show that the diffusible fraction is definitely increased by the administration of parathyroid hormone and that this diffusible portion is decreased after parathyroidectomy.[24] Imperfect experimental methods make this conception somewhat uncertain, although it has been partially confirmed. The function of the parathyroid hormone is probably exerted by its effect on the diffusible calcium, both ionized and nonionized, in the blood stream; in case of deficiency of calcium, more calcium, also diffusible, is drawn from the skeleton by its action. This diffusible portion is, of course, readily capable of elimination by the kidneys and bowel. Vitamin D appears to exert its influence, in part, through the parathyroid glands, since Hess and his collaborators have shown that ergosterol, which normally causes an increase in the blood calcium, does not have this effect after thyroparathyroidectomy.

Clinical applications.—It is obvious that the clinical use of parathormone is confined to two groups of cases: those in which it is desirable to bring about elevation of blood calcium temporarily, for relief of tetany, and those in which it is desirable to withdraw calcium from the body. The use of this extract in parathyroid tetany is well known and need not be considered here. It is also useful in the tetany of pregnancy[11,12] and in tetany associated with the diarrhea of nontropical sprue as Holmes and Starr, and Habein and I have shown. When parathormone is used to correct a condition of low blood calcium, the conjoint use of calcium salts and diets high in calcium and in vitamin D is necessary to prevent skeletal depletion. The use of parathyroid extract as a diuretic has been discussed recently by McCann and Meakins. The effects which are obtained probably are due to two causes: to increased excretion of fixed base (calcium) and to elevation of the serum proteins which may occur.

The use of parathormone as a decalcifying agent probably will receive more attention in the future. Aub and his associates[26] have shown that in chronic lead poisoning, lead is stored chiefly in the bones as the tribasic lead phosphate. They have shown also that any substance which increases the excretion of calcium will also increase the excretion of lead. Therefore, they have used large doses of parathyroid extract in the treatment of this condition, with beneficial results. Hench and I recently attempt-

ed to decalcify a patient who was suffering from chronic infectious arthritis, characterized by extensive deposits of calcium about the joints. The results were gratifying in that the patient lost considerable quantities of calcium and obtained increase in motion in the affected joints (Fig. 3).

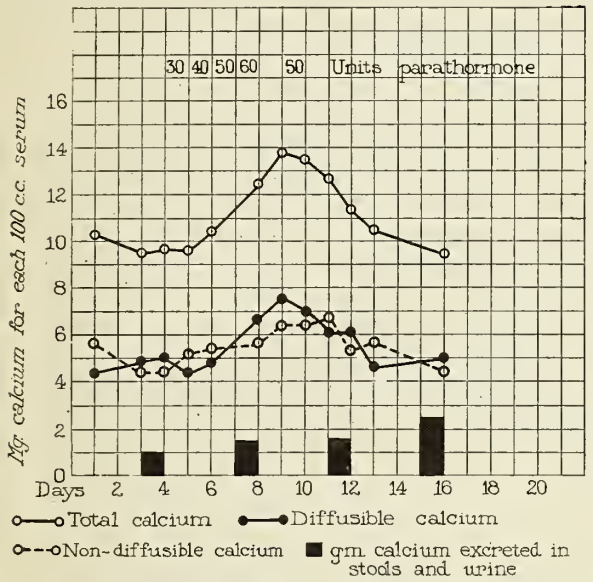


Fig. 3. The effect of parathormone on the calcium of the blood serum and the excretion of calcium in chronic infectious arthritis.

Parathyroid extract has been given by mouth for the treatment of various cutaneous conditions, as well as varicose ulcers, and sprue. The best authorities insist that it is without effect when given in this way, although the blood calcium may be elevated slightly by oral administration of parathyroid extract. Probably, however, the only proper use of parathormone is by hypodermic injections, and even there it is not altogether a safe substance for general use. The danger of hypercalcemia makes it necessary to determine the blood calcium frequently and its long-continued use undoubtedly will lead to skeletal defects. Curiously enough, tolerance to parathormone may be developed; this probably represents the refusal of the bony tissues to give up any more of the calcium which is needed for their integrity.

THE SUPRARENAL GLANDS

A third notable advance in endocrinology has to do with the function of the suprarenal glands. It has long been known that these structures consist of phylogenetically and functionally distinct portions: the cortex which arises from the wolffian body, and the medulla which originates in the embryonic sympathetic system. The secretion of epinephrine, which is a pure medullary product, is not the sole function of the glands. As numerous investigators[8, 13, 24, 55] have shown, the medulla may be removed or destroyed without the slightest effect on the health of an animal, whereas removal of both suprarenal glands is almost uniformly fatal. It seems from this that the cortex is the portion of the gland essential to life, and that the loss of cortical function is responsible for most, if not all, of the symptoms of suprarenal insufficiency. Kovacs reported a case of Addison's disease in which the cortex alone was destroyed; a similar case was recently observed at The Mayo Clinic. The desirability of studying the function of the cortical portion of the gland, and of obtaining an active extract from it, is obvious.

The function of the medullary portion of the gland in the intact animal is uncertain. Cannon expressed the belief that it may supply an emergency stimulant, whereas many other physiologists have thought that it is primarily a substance necessary for the maintenance of normal vascular tonus. The low blood pressure and asthenia of Addison's disease have been attributed, probably wrongly, to the failure of formation of epinephrine. The situation has been well stated by Hogben: "There are sufficient grounds to justify the conclusion that adrenalin is set free into the blood stream; it is neither unlikely nor proven that increased secretion of adrenalin plays a minor part in reënforcing the motor phenomena associated with fright and asphyxia, and there is no reason to believe that in mammals the chromaphil tissue serves a prominent or indispensable function in regulating the normal activities of the organism."

It has been suggested that the suprarenal cortex is necessary for growth and development, that it may neutralize toxic substances, and that it may be necessary for the formation of epinephrine from tryptophane. It has also been suggested that it has to do with the metabolism of lecithin and other lipoids. Alsterberg suggested that there is a close relationship between the secretory activity of cortical cells and the functional activity of the body tissues in general. A number of attempts have been made to prepare an active extract of the cortical tissue of the suprarenal glands; Rogoff and Stewart have

been pioneer workers in this field, and recently have prepared a substance designated as "interrenin" which appears definitely to prolong the life of suprarenalectomized animals. The clinical use of this substance in Addison's disease recently has been reported by them, with results which are somewhat difficult of interpretation, but certainly encouraging. At the clinic recently, observations have been made of a patient under treatment with this extract, who appears to have obtained definite benefit. It is only fair to say that the patients treated with interrenin have not lived longer or have not remained in better condition than certain patients who have been treated by the familiar Muirhead regimen.

The possibility that other active and biologically important substances may be derived from the suprarenal glands is now under consideration. Koehler,[29, 30, 31] of the University of Chicago, rerecently prepared a suprarenal extract which is epinephrine-free and which yet shows definite calorigenic activity. It was felt, at one time, that this substance might be the missing cortical hormone, but in a recent personal communication Koehler stated that this view was probably erroneous. The extract which he has prepared, however, has some very interesting properties. It appears to have a definite effect on metabolism of creatine and creatinine; the excretion of creatinine, which is a feature of many diseases characterized by muscular wasting and asthenia, is almost immediately reduced by the use of this substance. In such cases it is also capable of elevating the metabolic rate, of altering the curve of glucose tolerance, and of reducing the oxygen deficit after exercise. This substance has been used clinically with good effect in syndromes of exhaustion, presumably secondary to suprarenal deficiency. It has produced improvement in some cases of myasthenia gravis and in various forms of muscular dystrophy. There is not, as yet, sufficient evidence to warrant a decision as to whether or not this substance prolongs the lives of suprarenalectomized animals; in three cases diagnosed clinically as Addison's disease, my experience with it was unfavorable. Koehler, however, who has the advantage of a fresh supply, has treated one patient, with apparent benefit. All of the patients with Addison's disease who have been treated with Koehler's extract at the clinic were in a grave condition at the time treatment was started, which may explain their failure to improve. Further clinical studies are being carried out with this extract in a number of institutions in this country and a final report on its physiologic activity and clinical use may be expected shortly. At the present time, however, there is no available substance which will counteract or relieve the symptoms of suprarenal insufficiency.

SUMMARY

From the foregoing paragraphs, it is evident that, although much has been accomplished in the field of endocrinology, even more remains to be done. It does not seem likely that any new developments in the field will open up therapeutic possibilities equivalent to those that attend the use of insulin in diabetes, or of thyroid extract in myxedema. The endocrine structures, the functions and activities of which remain to be solved, seem far too complicated for simple solution.

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THE BOVINE THYMUS*

A Brief Description and Histological Study

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THE bovine thymus develops from the anterior pouches of the third and fourth branchial clefts, the neck-thymus originating from the third clefts, while the chest or heart-thymus develops from the fourth clefts. The bovine thymus, then, consists of two parts: a neck-thymus, which is broader at the base and smaller proximally, grooved on its inner surface for the trachea; and a heart-thymus, which lies in the mediastinum, smooth on its outer convex surface and concave on the heart side. In young calves these thymus glands weigh as much as 350 gms.

The heart-thymus is the first to retrogress, usually, having degenerated into a fatty mass at the end of two and one-half years, but vestiges of the thymus may remain in this location as long as three years. It seems that retrogressive changes do not begin to manifest themselves in the neck-thymus until the retrogression is complete, or almost complete, in the heart-thymus. Early retrogressive changes occur in the neck-thymus in the third year.

The neck-thymus persists in cattle up to twenty years, or longer. It persists longer in beef cattle than in dairy cattle.

The thymus is made up of cells of entodermal, ectodermal and mesodermal origin. Authorities differ as to the exact origin of the various cells found in the thymus and the matter is still under discussion. The histological structure is very much like that of the human gland, with the exception of Hassals' corpuscles, which are rarely seen, and the character of the giant cells in regard to the nucleus.

The bovine thymus in general resembles the same lobulated structure as that of the human gland. There is a more densely cellular dark-staining cortex, with a lighter central area, or medulla, less rich in cells. The cortex is made up of densely packed lymphoid cells and relatively few widely scattered giant epithelial cells. The medulla contains less lymphoid cells with relatively more giant epithelial cells than are found in the cortex. These large epithelial cells are mononuclear in contradistinction to these same cells in the human thymus, which are polynuclear. The nuclei are large and contain coarse granules which appear as long broken strands of a reticular-like network.



Fig. 1. A schematic illustration showing the origin of the thymus bodies from the third and fourth branchial clefts anteriorly. The superior and inferior parathyroids are illustrated as originating from the posterior pouches of the same clefts.

The nucleus is often situated at the side of the cell, and occasionally at, or about, the center. There is a relatively large amount of cytoplasm. These giant epithelial cells are stained faintly by eosin, with the exception of the periphery of, and the granules of, the large nuclei, which take a faint basic stain in contradistinction to the lymphoid cells, the nuclei of which stain deeply with hematoxylin.

These giant epithelial cells are more numerous in the neck-thymus than in the heart-thymus. The epithelial cells of the bovine thymus are peculiar to the thymus as the giant epithelial cells already described. However, the epithelial cells are found to be of varying sizes. The small ones have a large nucleus, larger than that of the lymphoid cells, with a relatively small amount of cytoplasm. The

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nucleus is more easily made out than that of the giant cell because it takes a slightly darker stain and the cytoplasm stains more distinctly with eosin. There are varying sizes of these cells from that of the small epithelial cell to that of the giant epithelial cell. The nucleus



Fig. 2. A photograph of the thymus of a young calf showing its relation to the trachea and heart. The lungs are laid back to expose the heart-thymus completely.

increases somewhat in size, but the notable characteristic of the giant cell is its relatively large amount of cytoplasm. It seems that these epithelial cells are various stages in the development of the giant epithelial cell, as they all exhibit the same staining qualities and general appearance of both the nucleus and the cytoplasm.

In addition to the lymphoid cells, there are cells with nuclei larger than the lymphoid cells, but with a very small amount of cytoplasm. Such a cell has been described in the human as being the result of the mitosis of the large epithelial cell. If this is true, it must serve the same function and, perhaps, in its turn attains to the giant size. The giant epithelial cells are essentially acid-staining, while the lymphoid cells take a basic stain.

Evidently there are two distinct and different substances in the thymus. The large number of lymphoid cells may carry on the function common to similar cells in the lymphatic system. It is well known that the blood of children before puberty contains a higher percentage of lymphocytes than that of adults. The giant cells, on the other hand, may be responsible for the secretion of a hormone peculiar to the thymus and, therefore, found in no other gland.

A precipitate obtained by glacial acetic acid from a saline extract of neck-thymus is a smooth paste of a delicate pink color like that of a beautiful pearl, while a similar precipitate of heart-thymus yields a white smooth paste, without any suggestion of a pink color. Is this due in any way to a greater preponderance of giant epithelial secretion?

The existence of a relatively large number of giant epithelial cells in the neck-thymus and the fact that the neck-thymus develops from the third branchial pouch (which seems to be the usual and main source of the thymus in the dog and the human where it is found in the chest and is called thoracic thymus) may be significant.

The first apparent changes in the beginning retrogression of the bovine thymus is a deposit of fat in the stroma between the lobules, which gradually increases as the lobules begin to shrink, so that in older cattle of eight to twenty years of age, the lobules appear as more and more widely scattered isolated islands, which become smaller and smaller. There is a marked diminution of the lymphoid elements, the cells and nuclei becoming smaller, though the giant cells remain in relatively larger numbers. This is not due to an increase in the number of the giant epithelial cells, but to the more rapid disappearance of the lymphoid cells. These giant cells at twenty years of age also show degenerative change to a marked degree. They lose their staining qualities. The nuclei become irregular in shape. The granules of the chromoplasm of the nucleus disappear and the entire nucleus takes on a faint basic stain as though these darker granules had gone into solution. The outline of the nucleus finally breaks down so that only the faintly staining cytoplasm of the cell remains. The color is a barely perceptible light pink under the oil immersion. In other places in the sections studied, simply spaces that were occupied by these giant

epithelial cells are found. Sections of an older bovine thymus require more eosin and less hemalum to bring them out. It is difficult to see the giant epithelial cells, even in sections from young calves, so as to make out their

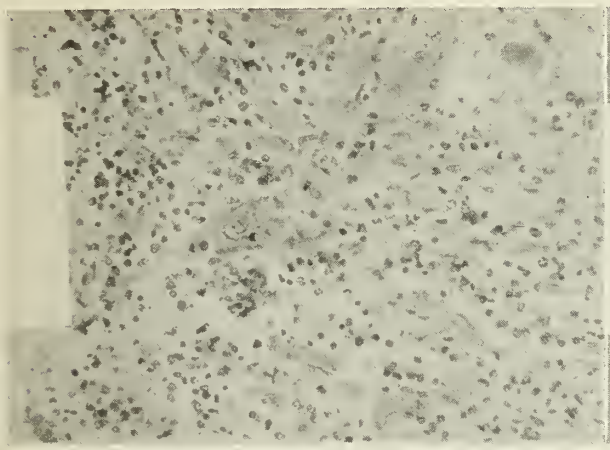


Fig. 3. High power microphotograph showing the giant epithelial cell of the bovine thymus. The large cell near the center shows the character of the nucleus.

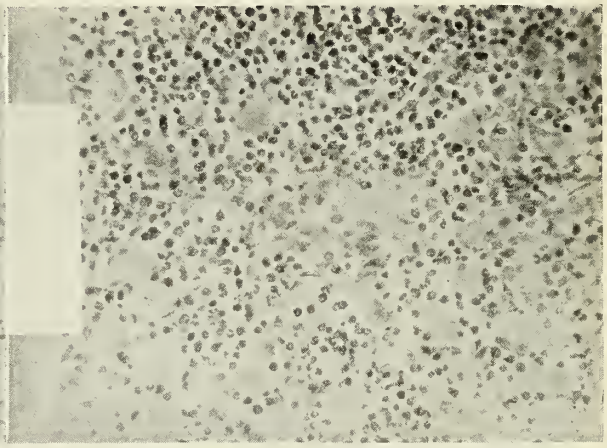


Fig. 4. Microphotograph showing the relatively large number of the giant epithelial cells found in the medulla of the lobule. The nuclei show faintly in places, but are very difficult to photograph because of their faint staining qualities.

definite appearance as they are faintly staining and well camouflaged among the lymphoid elements. Studies of the giant epithelial cells were made under the oil immersion.

This study has led me to suspect that, if the thymus gland has an internal secretion, or hormone, peculiar to itself, it is contained in this giant epithelial cell which is the true thymus.

Very little is known concerning the chemistry of the thymus. Several facts are of interest. Adenine is the predominant purine body, though guanine is also found. While the cells of this gland are very rich in nuclein bodies, they are relatively poor in proteins. Bang has shown that the thymus contains about the same amount of nucleoprotein, but about five times as much histone nucleate as the lymphatic glands. In other words—chemically the lypmh gland and the thymus have this in common: they both contain histone nucleate in large amounts. It can be precipitated from watery, also from weak alkaline extracts, by acetic acid. Extracts containing the lymphoid elements are rich in histone nucleate.

As far as the writer has been able to determine, all thymic extracts used, heretofore, in experimental work have been such extracts.

Arginase, guanase, adenase, and a proteolytic enzyme are found in the thymus. The proteolytic enzyme studied by Jones is interesting in that, contrary to trypsin, it acts best in acid liquids. It is readily destroyed by alkalies at body temperature.

As it is already known that the serum of the noncancerous has a far greater influence in retarding cancerous growth than that of the cancerous, and that of young infants about twenty-one times as powerful an influence in this direction, according to Engel, as that of the non-cancerous adult, it has already been suggested by some that this is thought to be due to the influence of the thymus as it is the only gland that shows marked retrogressive changes with advancing age. The only possible exception to this last statement is the posterior hypophysis, or pineal body.

With the idea that the internal secretion of the true thymus is locked up in the giant epithelial cells and on the supposition that this thymic internal secretion preserves normal epithelial health throughout the entire body, i. e., that it controls and keeps up normal epithelial growth and cell-repair, the writer set himself the task of isolating the true thymic hormone. In order to do this it seemed that a method of extraction that would break down the gland completely and that would exclude the lymphoid elements held out the best hope of solution. For this reason, the

writer has employed an original method that differs from all other known methods, which has resulted in the production of a clear extract with a protein content of about 2 per cent. This extract contains no histone nucleate. It is called Karkinolysin, because it

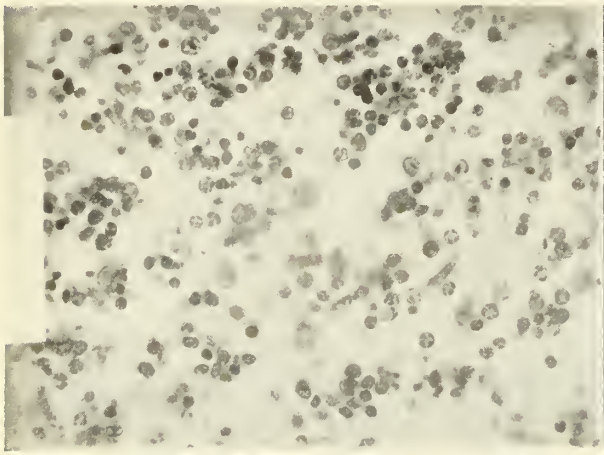


Fig. 5. Microphotograph showing the small epithelial cell of the bovine thymus.

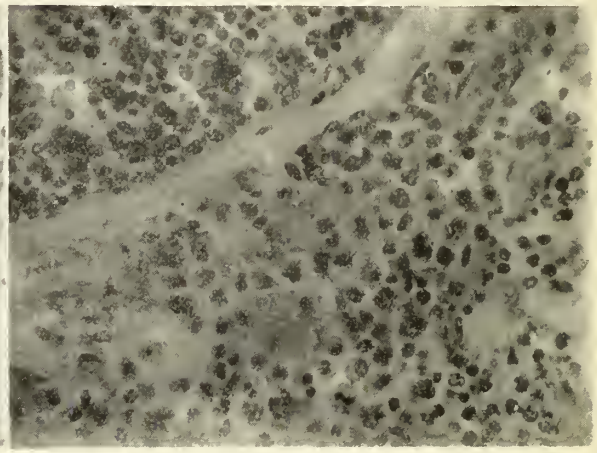


Fig. 6. Microphotograph showing the epithelial cells of various sizes in the bovine thymus. The darker-staining lymphoid elements at one side are readily identified.

seems to have a solvent action in carcinoma when injected intramuscularly daily over a period of months in highly malignant types and with as few as twenty injections in types of slower growth.

ACKNOWLEDGMENTS

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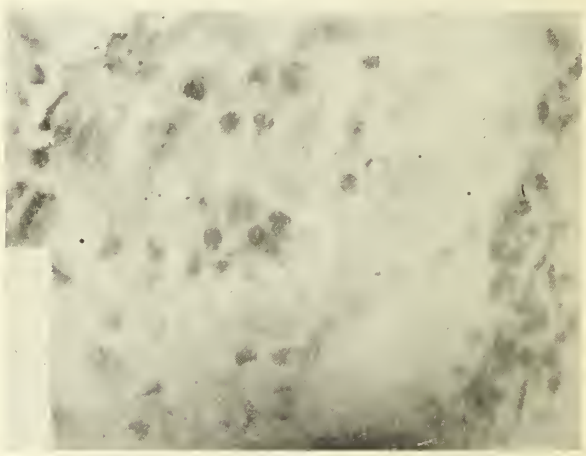


Fig. 7. High magnification of the giant epithelial cell in the thymus of a four year old cow.

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IODIZED OIL FOR DISEASES OF THE CHEST*

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VARIOUS attempts have been made in the past twenty-five years to find some non-irritating substance opaque to the *x*-ray for visualizing the bronchial tree. Bismuth oxide and subcarbonate insufflations, iodoform emulsion in olive oil, anhydrous thorium oxydate insufflation, bismuth subcarbonate suspended in olive oil have all been tried and in the main abandoned. Iodized oil on the contrary has been accepted universally since Sicard and Forestier made their first report in 1922. Since then it has attained a position in the diagnosis of diseases of the chest that is comparable in no small degree to the use of the barium meal in gastro-intestinal investigation or to sodium iodide solution for urologic examination.

In non-tuberculous diseases of the chest, the outstanding fact which the intra-tracheal use of iodized oil has made clear is that ectasis of the bronchi occurs much more commonly than believed heretofore. It is well, of course, to keep in mind the picture of the advanced bronchiectatic with cough of many years duration, with abundant, purulent, and frequently malodorous sputum, with the indefinite physical and *x*-ray findings, with the clubbed fingers, etc. But it is much more important to remember that bronchiectasis may not be advanced, that it may be not only early but dry. Iodized oil has taught us these two valuable lessons.

Furthermore, its use not only leads to a more exact diagnosis in a qualitative sense but gives a very precise idea as to how extensive any given bronchial dilatation may be and where it is located. These factors must be known definitely before any treatment can be instituted rationally.

Rules in medicine are dangerous by and large but I venture this one: That in all cases of chronic cough, dry or productive, where tuberculosis, heart disease, lung or pleural abscess and accessory nasal sinus disease (many people with chronic sinusitis have an associated bronchiectasis) can be ruled out, the injection of iodized oil is indicated to prove or disprove bronchial dilatation.

With lung abscess it is highly desirable to localize definitely the cavity or cavities, particularly if open drainage is anticipated. Here, intra-tracheal iodized oil may help, but in the majority of cases it will not. A number of factors are responsible for this failure. There may be a marked bronchial stenosis proximal to the abscess, a very common finding with lung abscess and one of the reasons which has made bronchoscopic drainage of this condition a very wise procedure; or the bronchial opening into the abscess may be so situated (the superior wall, for instance) that the oil cannot enter; or the size of the opening may be too small to permit the oil to pass, or there may be a plug of mucus or pus blocking the way or the cavity may be filled with exudate.

At times it may be desirable to outline clearly localized empyema cavities before operation. Iodized oil injected directly into the cavity does this decisively and especially so if *x*-ray films are made with the patient in various positions. Or again in certain obscure conditions intra-tracheal oil may reveal a partially stenosed bronchus which will lead to bronchoscopy and a more definite diagnosis. In outlining tracheo- or broncho-esophageal fistulas, iodized oil is preferable to barium because of its blandness.

In tuberculous diseases of the chest iodized oil should be used with discrimination. Some men contend that the presence of pulmonary tuberculosis is a contra-indication to the introduction of iodized oil into the tracheo-bronchial tree. I cannot agree with this restricted attitude. Others feel that acutely active lung tuberculosis militates against the use of the oil and with this view I concur heartily.

I have used iodized oil in tuberculous patients or suspects for two main purposes:

(1) For study of unexplained hemoptysis.

(2) For further investigation of unsuccessful thoracoplasty.

In studying persons with unexplained hemop-

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tysis, iodized oil has been utilized with early or dry bronchiectasis in mind. It is taught today that ninety-five per cent of unexplained hemoptyses is due to pulmonary tuberculosis. I doubt this. There can be no doubt that there is a tuberculous basis for a high percentage of these hemorrhages, but I am convinced by experience that some of the ninety-five per cent are bronchiectatics. It is being appreciated more generally that bronchiectasis is a frequent cause of hemoptysis which at times is profuse. The judicious use of iodized oil will save many persons in this group of unexplained hemoptyses an unwarranted diagnosis of pulmonary tuberculosis.

In any group of thoracoplasty cases there will always be a number who continue to cough and raise sputum, which may or may not contain tubercle bacilli, in the face of what appears to be a good collapse. Physical examination in most of these people tells no more than was known before. Stereoscopic films of the chest may not be helpful because of extensive fibrosis, thickened pleura, or both. Despite the more or less empirical warnings in the literature, I began using intra-tracheal oil in a few selected thoracoplasty patients who had not exhibited reasonable improvement. Nothing eventful happened and the oil did disclose the reasons for failure. It was found that unsuspected bronchiectasis, unclosed cavities, or both, were the main causes of unsuccessful thoracoplasty. These findings, which were consistently present in subsequent cases, led to routine phrenic nerve avulsion, preliminary to thoracoplasty, and to more extensive rib resections.

Iglauer and Kuhn[2] feel that brominized oil is more suitable for tuberculous patients. The technic necessary is not as simple as with iodized oil and they admit that the shadow cast by brominized oil is not as dense. I have followed some forty tuberculous patients at Pokegama Sanatorium and at the Ancker Hospital Tuberculosis Pavilion who have had iodized oil injected intratracheally, and I see no reason for discontinuing its use, providing the tuberculous lesions are chronic and other contraindications absent.

There are five methods for introducing the oil into the tracheo-bronchial tree: (1) supraglottic; (2) transglottic; (3) subglottic; (4) passive; and (5) bronchoscopic. I have used the supraglottic route exclusively in over two hundred injections and have found it quite satisfactory. Any portion of the bronchial tree can be reached by altering the position of the patient, as the oil is heavy and gravitates readily.

Smyth and Schall[6] make a strong plea for the bronchoscopic method, believing that a thorough cleaning of the bronchial tree is essential before the oil is injected. I have not found this to be so and further feel strongly that a person with lung tuberculosis should not be submitted to bronchoscopy except for emergencies. Ochsner[3] favors the passive method; Pritchard[4] the supraglottic. In small children either the subglottic (puncturing the crico-thyroid membrane) or the bronchoscopic method must be used for obvious reasons. The youngest patient I have injected was eleven years old and no difficulty was encountered with the supraglottic method.

The possible complications from attempting to inject iodized oil into the tracheo-bronchial tree are:

1. Acute enteritis. This results from swallowing the oil, with subsequent liberation of free iodine by the action of the alkaline intestinal secretions. This has not occurred in any of my cases although some have managed to get oil in the stomach.

2. Iodism. This may result from swallowing oil or may occur because of an idiosyncrasy. This also is uncommon. It has happened only once in a mild form in my experience.

3. Aspiration pneumonia and lighting up of old tuberculous foci are two other possible complications but I have seen neither of them.

The two most important contraindications to the use of iodized oil intra-tracheally are:

1. Acute or recent upper respiratory infection.

2. Acutely active tuberculosis of the lungs.

It is well also to refrain from using the oil in any condition in which freedom from even mild strain is imperative.

The ultimate disposition of iodized oil after it has entered the tracheo-bronchial tree and lung parenchyma is interesting. The iodine is liberated so slowly that it does not irritate and is eliminated in the urine. The oil in the pulmonary alveoli, according to Brown,[1] is taken up by phagocytes apparently of endothelial origin which follow on into the lymphatic system. It is questionable whether direct absorption or digestion of the oil occurs. A certain amount of the

oil is eliminated by expectoration. Some people will retain for months enough oil in their lungs to cast a shadow on an *x*-ray film with no demonstrable ill-effects.

The potential therapeutic action of iodized oil has held forth enticing possibilities because of its iodine content. Many men have been impressed by its action on bronchiectasis. I have given series of injections to ten persons with bronchiectasis. Six had enough reduction in cough and sputum to have returned asking for more oil. Three showed no improvement. In one instance only have I been able to render a patient with definite bronchiectasis, cough- and sputum-free. Pritchard thinks that if used repeatedly (twelve to sixteen injections at weekly intervals) iodized oil produces fibrotic changes in the bronchial wall and surrounding lung parenchyma with subsequent shrinking and in early cases of obliteration of the dilations. This has not occurred in any of my cases.

Ransohoff and Heiman[5] have called attention to the beneficial action of iodized oil in treating empyema and reported four acute cases and one chronic which healed promptly after its use.

It seems, therefore, that iodized oil has some curative value. In the main, however, it will remain a diagnostic agent in diseases of the chest as in other fields, with any reputation for healing occupying a position of secondary importance.

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THE VALUE OF THE *X*-RAY EXAMINATION IN PULMONARY TUBERCULOSIS*

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THE importance of the *X*-ray examination in the diagnosis and study of pulmonary lesions, especially tuberculosis, is well known. The amount and character of the information obtained by this method is not so clearly understood. In order to be able to appraise the results of an *x*-ray examination, the limitations, possibilities, and factors of error in the method must be defined.

The technic of the *x*-ray examination of the lungs is of the first importance. Fluoroscopic examination is of little value in the diagnosis of early or minimal tuberculosis. In the later stages, gross lesions may be recognized and much information may be gained in particular cases, but on the whole the results of fluoroscopy are neither accurate nor dependable. Films of the lungs must be made, preferably stereoscopic, the latter being of especial importance in the diagnosis of the early case. The films must be technically almost perfect. In order to achieve this it is necessary to have a powerful *x*-ray transformer capable of sufficient energy to make very rapid films. Intensifying screens must be fast, flawless, and much have good contact with cassettes. This necessitates frequent changing of both screens and cassettes. A fine focus tube must be used and the films must be made without movement or breathing on the part of the patient.

It is dangerously easy to obtain findings simulating early tuberculosis or to obliterate the signs of an early tuberculosis as a result of poor technic. Most of the errors which we observe, however, are on the side of overinterpretation rather than underinterpretation. It must be borne in mind that the roentgen diagnosis of tuberculosis is considered to be a very certain one; a patient should never be stigmatized with it without adequate evidence. It is a frequent experience to see a diagnosis of pulmonary tuberculosis made from the *x*-ray examination because of coarsening of the normal broncho-vascular markings in the lung. This may be due entirely to a broad focus tube, or to lack of speed. On the other hand, if fine detail is lacking in the film of the chest, minimal tuberculosis may be easily overlooked.

If we assume that the *x*-ray technic is good, what can we determine from the roentgen examination of the lungs in a patient suspected of tuberculosis? The first consideration is whether there are any abnormal changes in the lungs. The symptoms of tuberculosis may be simulated by a host of other conditions. Tuberculosis may exist in the body elsewhere than in the lungs and give the same systemic symptoms. The roentgenogram presents a fairly accurate picture of the pathology in the lungs; in many cases almost as accurate, when properly interpreted, as a gross pathological examination. The absence of any abnormal changes is the best, the most conclusive, evidence against pulmonary tuberculosis that we now have. It can be stated that, in the presence of symptoms due to tuberculosis of the lungs, some *x*-ray signs will almost always be present if an adequate examination has been made. With only one or two exceptions, I have never seen a case presenting symptoms of tuberculosis and which eventually proved to really have pulmonary tuberculosis in which the *x*-ray examination was negative. In the absence of *x*-ray signs, therefore, the presumption is overwhelmingly against the diagnosis of tuberculosis in the lungs.

On the other hand, it is often astonishing to find extensive changes in the roentgenogram of the lungs which were unsuspected even after careful examination by experienced clinicians. This occurs sufficiently often to point out the necessity for roentgen examination in every case suspected of pulmonary tuberculosis. Even if the physical examination is entirely negative, no patient presenting symptoms suggestive of tuberculosis should be allowed to go without an adequate *x*-ray examination of the lungs. In most cases the *x*-ray signs are present before the physical signs become apparent. The presence of typical roentgen findings is positive evidence of pulmonary tuberculosis second only in certainty to the finding of tubercle bacilli in the sputum.

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It should be noted, however, that not infrequently abnormal changes are present which are not typical. Under these circumstances the *x*-ray examination merely indicates the presence of pathology; the clinical examination must determine whether it is tuberculous or otherwise. Usually the coördination of symptoms, physical signs and *x*-ray findings will determine the diagnosis definitely. Frequently it is necessary to reexamine at an interval of one or two months to rule out the possibility that the lesion which has been observed was due to some acute condition. Cases of atypical bronchopneumonia, especially those secondary to influenza, pulmonary congestion, acute bronchitis, chronic bronchitis and bronchiectasis, chronic or unresolved pneumonia, and chronic lung fibrosis, may be difficult to differentiate at times; the clinical findings in some cases and reexamination with the *x*-ray in others will usually indicate the correct diagnosis.

Shadows in the lung fields characteristic of tuberculosis do not, however, necessarily mean active tuberculosis. This is exceedingly important because such a large percentage of apparently normal individuals have healed lesions which may give more marked *x*-ray findings than a recent active infection. For example, changes in and about the lung roots in adults are very commonly present and, in themselves, are usually of no importance. Fibroid lesions in the apex, pleural thickenings, and calcifications in the lung fields are very frequently seen but in most cases they have no clinical significance. All other types of shadows usually have a more important bearing on the immediate condition of the patient but the actual activity cannot always be determined with any great certainty by the *x*-ray examination. It is true that in some cases the sharpness, density, and discreteness of the shadow may clearly indicate a healed or quiescent lesion. In others a hazy, radiating, not sharply demarcated, soft-looking shadow may determine definitely that the disease is active. In general, however, the activity or quiescence of the disease should be determined by the symptoms and physical signs.

The diagnosis of tuberculosis having been established, much more information may be had from the roentgen examination and here again the accuracy of this method is of great value. We can determine the extent of the lesion, whether it involves more than one lobe, or more than one lung. The demonstration of the complete freedom of one lung from disease is obviously of the greatest value as an indication of whether or not surgical procedures should be used for therapy. The extent of the lesion will to a large extent determine the prognosis.

The character of the tuberculosis present may also be made out in this way. In general, pulmonary lesions may be classified as exudative or proliferative, although in most cases both types are present. The proliferative lesions tend to give rather sharp, fibrotic-looking dense bands, or moderately discrete, fairly dense nodules. The exudative types are more likely to be hazy, feathery, not sharply outlined, very irregular masses. Usually the latter indicate a very active, somewhat malignant, rapidly progressing process. On the other hand, if cure takes place, the exudative type of lesion will show the least amount of scar and residue. It is often astonishing to see the complete disappearance of what appeared originally to be a far-advanced tuberculosis. Much of the shadow seen in this type of case is really due to secondary collateral inflammation in the lung rather than to actual tuberculous infiltration.

The presence of cavities, of course, modifies the outlook in any case of pulmonary tuberculosis. Their presence can be most easily detected by *x*-ray examination. Acute miliary tuberculosis within a week after its onset usually gives definite *x*-ray findings and a definite diagnosis may thus be made very early. Tuberculous pneumonia, pleural thickenings and pleural effusions, spontaneous pneumothorax, can be accurately delineated often long before the symptoms or physical signs make the diagnosis possible.

Finally, there is no better method for observation of the patient with pulmonary tuberculosis than serial roentgenograms. These give an accurate history of the pathological events which are taking place in the lungs. The extension of the tuberculous process to a lower level in one lung or to the other lung, the appearance of a cavity, the development of a bronchogenic dissemination or of a miliary spread, all can be clearly demonstrated if *x*-ray films are made at suitable intervals with a reasonably constant technic. On the other hand, the gradual progress of an active exudative lesion into a quiescent proliferative one can be readily observed. The appearance of fibrotic bands, pleural adhesions, retraction of the trachea, mediastinum and diaphragm, and the

deposition of calcium in the lung fields and mediastinal lymph nodes—all the evidences of a healing process—can be clearly discerned in this manner.

During the course of collapse therapy the roentgen examination is invaluable. The amount of pneumothorax, the degree of lung collapse, the onset of complicating pleural effusion, the position of the diaphragm after phrenic exuresis, and the position of the bony thorax after thoracoplasty, can all be best observed by fluoroscopic and repeated film examinations.

It is outside the scope of this paper to discuss the actual diagnostic criteria of pulmonary tuberculosis in the roentgenogram. I must reiterate that most of the errors lie in overinterpretation of normal findings. This is particularly true of the vascular markings in the lungs which under various conditions may be accentuated. It must be borne in mind that the first and only pathognomonic lesions of tuberculosis are the tubercles. These are in the parenchyma of the lung and tend to give nodular areas of density or a veil-like shadow near the periphery. They do not follow the vascular tree in any organized form and varying accentuations of the latter are usually of little significance in the diagnosis of pulmonary tuberculosis.

SUMMARY

1. Technical factors in the roentgen examination of the lung for tuberculosis are of great importance. Fluoroscopy is of little value in the diagnosis of early cases and stereoscopic films of the highest quality are imperative.

2. A negative *x*-ray examination is the best evidence against pulmonary tuberculosis that we have. In the presence of symptoms due to tuberculosis in the lungs the *x*-ray examination is almost always positive.

3. Every patient with symptoms suggestive of pulmonary tuberculosis should have an adequate *x*-ray examination regardless of a negative physical examination.

4. Next to a positive sputum, characteristic *x*-ray findings are the most positive evidence of pulmonary tuberculosis.

5. The *x*-ray findings frequently do not indicate whether the tuberculous lesion is active. This may be better determined by the clinical findings.

6. The roentgen examination gives an accurate picture of the extent and type of the tuberculous lesion which is present. It is an invaluable aid in determining the type of therapy to be used, the effects of therapy and to follow the progress of the disease.

THE MANAGEMENT OF TUBERCULOSIS*

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"When we consider the transcendent importance to the human race of the observations of Koch on the etiology of tuberculosis, and the completeness of his demonstration of the communicable and preventable character of the disease, it seems difficult to understand the limited extent of the sanitary procedures since adopted for its restriction. The imperative demand for the enforcement of comprehensive measures for the prevention of tuberculosis should have been as evident to sanitarians twenty years ago as it is today."

—Herman M. Biggs, 1904.

TWENTY-FIVE years have passed since Dr. Biggs made this statement. Koch is credited with the prophecy that "not until a younger generation has appeared which has had a different scientific training, and holds views more in harmony with the known facts regarding the etiology of tuberculosis, will it be possible, in my opinion, to bring about an intelligent supervision of the disease." With both retrospect and prophecy before us, let us evaluate the accomplishments which have been made in the management of tuberculosis.

The attitude of the profession towards tuberculosis in the past was one of interest in a continuous study of pathology from the time of diagnosis to the time of death. The patient contributed his part by remaining immobilized for weeks and months, optimistic and hoping for recovery, while the doctor separated himself from the patient by an impassable gap, waiting for death.

The management of tuberculosis has become a specialized problem in medical administration. Many difficulties have been overcome. Many advantages have been recognized and accepted. Sir Edward Newsholme has concluded, after making an exhaustive study of the results of isolation in tuberculosis control, that, "If you will isolate twenty per cent of the open cases of tuberculosis in any community for a period of four months each year, the death rate from the disease will show in that community a yearly decrease of two per cent. Since 1900 the sanatoria in the United States have increased from 42 to 700, while the beds for cases of tuberculosis have increased from 3,600 to 73,000.

As facilities have been provided for the care of the tuberculous, a marked reduction in the death rate confirming Newsholme's conclusions has occurred. In 1900 the death rate was 202 per 100,000 population, while in 1926 the death rate had fallen to approximately 87 per 100,000 population.

The sanatorium has evolved from a primitive institution to one that meets the requirements of modern treatment. Dr. David R. Lyman has said, "Our first idea of a sanatorium was a porch, a reclining chair, a rule book, three quarts of milk and six eggs a day, and a chest examination once a month. In those days a sanatorium was usually conducted by a sick doctor who had been hired principally because of the fact that he was cheap. We have found out that tuberculosis work, whether in the sanatorium or hospital, requires as high a grade of medical service as that of the most modern general hospital."

The sanatorium, from this primitive conception, has gradually become a socially-minded institution, and as a result it has extended its activities into the community it serves. The tuberculosis field nurse has become an adjunct to the sanatorium whose value can not be overestimated. The medical staff are health officials doing in their sanatoria epidemiological work of great value and importance. The sanatorium has become the center for many health activities in tuberculosis work. It has changed so much in construction, administration, equipment and service, that it does not differ materially from the general hospital. This change has been brought about so quietly and so completely that the first recognition of the fact has come through the demand for the use of tuberculosis beds in general hospitals. The acceptance of such cases in general hospitals is a compliment to the sanatorium. They meet on common ground for a single purpose. The fact that most communities are served by general hospitals, and that comparatively few are served by sanatoria, makes it possible to

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promptly isolate open cases by the use of these additional beds in general hospitals. The immediate use of general hospital beds in the community reduces prolonged exposure at home while remaining on the waiting list for admittance to either a local or distant sanatorium. The open case in the general hospital is possibly of greatest value for the training it gives to doctors, nurses and attendants in preventive methods. It results in the popularization of sanatorium teachings and practice throughout the entire medical and nursing professions. It is true that tuberculous patients offer a risk to both hospital personnel and to the other patients; so also do pneumonia, typhoid fever, influenza, syphilis, and dysentery cases constitute a risk to those not infected. The problem is in the early recognition of the possible danger in each type of disease and sterilizing the infected discharges before they are permitted to enter an environment that eventually leads to contact with another human being. The danger of contact tuberculosis infection does not lie in the fact that a known open case is housed next to a susceptible person, but that many unknown cases are carelessly establishing such contact. The opening of general hospital beds will increase many times our capacity for the prompt hospitalization of cases, and the training given will result in a tremendous advantage to our future anti-tuberculosis work. The sanatorium can no longer be considered other than a specialized hospital. It teaches its patients the value of routine and self-discipline. Its patients hospitalized for long periods of time have many intercurrent disabilities which demand immediate and expert attention. The sanatorium takes an active interest not only in the convalescence of its sick, and their eventual discharge, but also their social and industrial re-establishment. The use of general hospital beds for tuberculosis cases will add more treatment beds than can be acquired through any sanatorium construction program. Prophylactic technic will become a procedure in common use throughout all hospitals. This change in the physician's attitude towards the care of tuberculosis will bring about a saner appreciation of the problem as a whole throughout all classes of society. The sanatorium has become, and promises to become even more, a community health center where health habits and health discipline are major activities.

The management of tuberculosis, the study of its prevalence as well as the many phases of its epidemiology, cannot be made a part of our future plans of offensive warfare without the aid of carefully and daily compiled records. The newly admitted patient must have records, and these records must be studied individually and collectively. The end-results of such data and study will be a check upon the efficiency in terms of service which the sanatorium renders the community it serves.

The successful management of tuberculosis depends largely upon the accurate interpretation of its epidemiology. Much of the data invaluable to the epidemiologist can be gotten only in the sanatorium. Good institutional administration must have such data recorded and accumulated for this study. It is, therefore, essential that complete coöperation exist between the leaders along the entire offensive front. It is problematical whether it is good tuberculosis control (surely it cannot be considered good logic) to include in the preventorium parenchymal and juvenile types of the disease. The tuberculosis school of the Lymanhurst type has proven itself more economical and epidemiologically safer than the preventorium which houses mixed types or permits association with adult cases. So far as the management of tuberculosis is concerned, the school, the preventorium, the sanatorium and the clinic are each an instrument of its epidemiology. In order that these instruments may be manipulated to the greatest advantage in tuberculosis control, some central control of the problem must be developed and maintained.

Since the discovery of the tubercle bacillus in 1882 by Koch, the most outstanding improvement added to the treatment of tuberculosis is the acceptance of surgery by the tuberculosis specialist as a routine mode of treatment. This has not only aided in the recovery of individual cases, but has radically altered our conception of the management of the disease. In the past, laws were frequently enacted providing that one sanatorium should care for early treatable cases, while another was designed for far advanced cases only. Surgery has upset the feasibility of any such arrangement. Many cases rated under this interpretation of legal enactment as far advanced would remain indefinitely for domiciliary care. With the aid of surgery, spectacular recoveries have been effected. With the possibility of surgical interference, all cases of pulmonary tuberculosis must be considered as treatable until the terminal stage has been reached. This radi-

cal change introduced into the therapy of tuberculosis has revolutionized its management from the patient's as well as the physician's point of view.

The point of breakdown is always a landmark in the history of each case of pulmonary tuberculosis. At this point toxemia overcomes resistance, making it difficult or impossible for the patient to carry on. Prior to and leading up to this event the patient gives rather accurately a history of a train of symptoms beginning from a fairly well identified incident or date which leads to the third milestone in the development of clinical tuberculosis—the end-results of a series of accidents which began with the initial infection followed by the onset of definite and continuous prodromal symptoms eventually bringing the patient to the point of breakdown. The prodromal period in pulmonary tuberculosis is as characteristic of this disease as is the prodromal period of typhoid, measles, smallpox or lobar pneumonia. Frequently the infection does not progress far before the individual wins the battle and the prodromal symptoms are aborted or controlled. Most frequently the infection does not progress sufficiently to usher the individual through or even into the prodromal stage. It is a very small minority group of those originally infected that ultimately reach the point of breakdown. Yet it is this relatively small group that make tuberculosis the problem that it is. The biology of the tubercle bacillus is such that it must depend upon this small but selected group of human beings to live and propagate. The most successful warfare against tuberculosis is that carried on before the infected body has been converted into a host. To give the patient the greatest benefit of treatment the disease must be identified while still in the prodromal stage.

The patient knows rather accurately the circumstances surrounding the onset of prodromals that have led up to the point of breakdown. Cases that become far advanced through progressive infiltration do so quickly following the initial breakdown or subsequent periods of reactivation. If medical science is to aid the tuberculous it must be given early through focusing its energy upon the identification of the disease before the point of breakdown has been reached. Identifying the early case becomes of importance only if hospitalization can be immediately secured and treatment initiated. The initial infiltration is frequently the only one. This may be either minimum or extensive so far as area involved is concerned. Spreads from the initial lesion, while frequently observed, are relatively rare. The far advanced case and the minimum case have suffered in varying degrees from similar accidents. Further spreads from the original infiltration are usually due to causes other than those responsible for the original lesion. The far advanced case frequently remains so throughout a long period of observation, showing little or no tendency to, or evidence of, progression. The minimum case only occasionally will show progression into the far advanced group by a series of spreads. Effective treatment must depend upon the diagnosis being made as early during the prodromal period as possible and immediate bed rest provided. The closer to the onset of initial symptoms, and the postponement of the time of breakdown that treatment can be instituted, the greater will the results be from such treatment.

Regardless of how we approach the management of tuberculosis, we will persistently return to the two pillars upon which the entire problem rests, treatment and epidemiology. The one can be carried out to most advantage in the sanatorium; the other is more comprehensive and includes the sanatorium as well as the entire environment of the patient and his associates.

The recent work showing the prevalence of pulmonary tuberculosis among children of high school age, the advantage to the patient in establishing an early diagnosis, the significance of the skin reactions, all give abundant evidence of the fact that the effective control of tuberculosis is closely related to its epidemiology. Every sanatorium should be as active in the study of the epidemiology of the disease as they are in its therapy. Only by making the sanatorium a center in the community for the collection of data, the dissemination of knowledge and making epidemiological studies in the families who have members on the cure as well as making it a place to receive and care for those actually ill, can the institution serve its mission. The sanatorium must become more than a repository for sick bodies. It must be alive to its opportunities for study and service. If the sanatorium is to maintain its position of leadership in tuberculosis work it must offer both positive therapy to the sick and positive service to the community.

(To be concluded in next issue.)

HYPERLEUKOCYTOSIS IN DIABETIC COMA*

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A MARKED leukocytosis is a frequently observed phenomenon in diabetic coma. Competent observers have agreed that this is not an infectious leukocytosis and is a characteristic of an uncomplicated diabetic coma. There is an apparent correlation between the amounts of acidosis (that is, the acetone, diacetic and B-oxybutyric acid) and the increase of the circulating leukocytes. Joslin[3] reports five cases of marked leukocytosis, the count ranging from 14,000 to 44,100 and without history of infection or hemorrhage from the stomach. Allan[1] likewise has reported five cases in which the leukocytosis ranged from 16,000 to 66,400 uncomplicated by infection. He brings out in his publication the difficulties sometimes observed in the differential diagnosis between diabetic coma and an acute abdominal condition. Klaus Barner[2] reports two cases in which the patients were in coma or precoma, and the blood examinations showed a distinct stimulation of the leukocytes. He found a marked shift to the left (Schilling's method). There was a great relative increase of neutrophils and shifting to myelocytes. He believes that the acetone bodies are probably the cause of the change in the blood.

In one of our cases to be reported, detailed hematologic study showed the response to be in the granulocytic series. Sabin[4] believes that the granulocytes are developed between the sinuses of the bone marrow and migrate into the sinuses when they are dilated. In her concept the oxygen tension in the bone marrow plays a very important part in the dilatation of the sinusoids. It may be that the noxious agent causing the increased circulation of white cells is the acetone bodies in the blood. These bodies may cause a dilatation of the sinuses in the bone marrow, hence, according to the Sabin theory, the increase in the circulating white cells. It is interesting to note that the lymphoctyes and monocytes were not particularly affected. What the relationship is between the age of the patient and the increased circulating white cells is questionable. We know that in youth there is a greater response in the white blood count to stimulation both by bacterial toxin and metabolic products. In the older case to be reported there was no detailed blood study made, but the white cell count reached 24,000 without any evidence of infection.

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CASE REPORTS

Case 1.—Miss C., aged 15, Jewish.

Past History: She has been a diabetic for seven years, and during this time has been in coma three times. A diagnosis of diabetes mellitus was made for the first time during an attack of otitis media complicated by diabetic coma. We have no detailed report concerning the blood in the first attack of coma. She has been studied and followed continuously in the University Dispensary and Hospital from December 28, 1923, to date. During this time her diet was gradually increased until she was receiving carbohydrates 65, protein 55, and fat 150, with insulin 20, 10, 30, 10.

The day before admission the patient was slightly nauseated and did not eat much food and for that reason discontinued her insulin. The next morning a doctor was called who gave her 10 units of insulin. By noon she was nauseated to the extent that she was vomiting and complained of pain in the midepigastrium. She was then referred to the University Hospital.

Physical Examination: On January 23, 1928, the patient was admitted to the University Hospital, presenting the picture of diabetic coma with unusually pronounced and persistent Kussmaul breathing. The patient did not take her evening insulin and that night became nauseated and started to vomit and gradually went into deep coma. The body temperature on admission was 97, pulse 140. The systolic blood pressure varied from 80 to 60 and the diastolic from 30 to 0. Blood pressure gradually increased to systolic 115, diastolic 75. The eyes were soft, skin dry, chest negative. The heart was rapid and irregular, but on treatment became regular. On admission there were a few crepitant râles heard over the bases of both lungs, posteriorly, which did not persist. The abdomen was markedly distended with slight tenderness in the epigastrium. Reflexes were hyperactive. Temperature the first day reached 97 degrees Fahrenheit. The following days the temperature was not observed higher than 100.

Laboratory Examination: The blood showed 600 milligrams of blood sugar per 100 c.c. of blood and the reduction of the CO_2 combining power to 11 volume per cent (Van Slyke). The patient was brought out of coma by the routine procedure, outlined by Joslin. The urine contined a large mount of acetone and diacetic acid, a few red blood cells, and many

granular casts. This gradually cleared up. The Wassermann examination was negative. The blood urea nitrogen 16.

The interest centers around the behavior of the leukocytes. On admission January 23, 1928, white blood cells were 79,000; two hours later 72,000. The next morning, 13,000 and 14,000. Red blood cells were 5,070,000, hemoglobin 97 per cent.

	Blood Sugar	*Van Slyke*	*White Blood Count*
January 23, 10:30 A.M.	.600	11%	79,000
January 23, 4:30 P.M.	.520	15%	72,000
January 24, 8:00 A.M.	.066	32%	24,000
January 24, 2:00 P.M.	.090	40%	
January 25, 8:00 A.M.	.155	43%	14,000

Her diet was gradually increased until she was receiving 60 grams of carbohydrates, 55 protein, 140 fat, and with this she was receiving 70 units of insulin. After twenty-nine days in the hospital she lapsed back to coma due to inactive insulin. The blood sugar on February 27th showed 465 milligrams per 100 c.c. of blood and the reduction of CO_2 combining power to 9 volume per cent (Van Slyke). The patient was again brought out of coma by the same procedure.

Both times with the gradual improvement of the diabetic condition the urine, which was heavily loaded with acetone bodies, gradually cleared up and the white count approached normal.

	Blood Sugar	*Van Slyke*	*White Blood Count*
February 27, 1928	.465	9%	97,000
February 28, 1928	.319	31%	
March 1, 1928	.222	45%	22,000
March 2, 1928	.163	60%	14,000

The following detailed morphological study of the blood at the peak of the leukocyte count (97,000) was made by Dr. C. H. Watkins: The erythrocytes show a moderate anisocytosis, moderate polychromatophilia and an occasional normoblast. The neutrophiles are markedly shifted to the left as far as the leukoblast stage. The predominating cell is the myelocyte although numerous premyelocytes are present. The eosinophiles are likewise immature, most of the cells being in the metamyelocyte stage. The basophiles are increased in number but are, for the most part, mature. The lymphocytes are relatively decreased in number, but show no evidence of immaturity. The monocytes are slightly immature and the cytoplasm contains abundant azurophilic granulation. The blood platelets appear to be increased and are smaller than normal.

After the leukocyte count returned to normal, the morphological blood picture became entirely normal and remained so.

This response in the leukocytes is not present in the young diabetic only, for we have one other case in a patient forty-six years of age who had proportionately the same response. The following illustrates how difficult it often is to make a diagnosis of an acute abdominal infection in diabetic coma. Her cardinal symptoms were nausea, vomiting and pain in the epigastrium with a leukocytic response of 24,000. She was admitted to the University Hospital on two occasions in diabetic coma. The second time she had a definite history of upper respiratory infection, but the first time we were unable to demonstrate the infection. It is for this reason that this case is incorporated in this paper.

Case 2.—Mrs. M., aged 46.

History: She had had no serious illness during her childhood, but at eighteen years of age had an attack of smallpox. At forty-three years of age she had an appendectomy and it was during the routine examination preparing her for this operation that sugar was found in the urine.

The patient was put on a qualitative diet, taking insulin irregularly, usually 15 units daily. On July 3 she went on a weekend party. She became nauseated, had pain in the midepigastrium and then vomited. She then took 15 units of insulin and felt much better. That night her symptoms recurred and in taking her insulin she broke the needle and hence discontinued the use of insulin. She was taken to her home in rather critical condition and her home doctor made a diagnosis of intestinal obstruction. A consultant was called who recognized the condition as diabetic coma and who then referred her to the University Hospital on July 6.

Physical Examination: The patient was a tall, undernourished, white female in severe coma with marked Kussmaul breathing, and marked dehydration. The eyes were soft, tonsils small, neck normal. The lungs were negative, pulse 140, heart regular and within normal limits in size. Blood pressure 88/65. The abdomen was extremely tender in the epigastrium on palpation, but there was no rebound tenderness. Rectal and vaginal examinations were negative. The reflexes were hyperative. The eye-ground findings were negative.

Laboratory Findings: The blood on admission showed 450 mgm. of blood sugar per 100 c.c. of blood and the reduction of the carbon dioxide combining power was 7. Hgb. 100 per cent: r.b.c. 4,960: w.b.c. 24,000; differential p.m.s.s. 80 per cent, lymphocytes 20 per cent; Wassermann negative. Stool examination proved negative. *X*-ray of the extremities showed no calcification of the arteries.

The patient was brought out of coma by the same procedure as above.

	Blood Sugar	*Van Slyke*	*White Blood Count*
July 6th, 10:00 P.M.	.545	7%	24,000
July 6th, 6:00 P. M.	.468	11%	
July 7th, 8:15 A.M.	.078	44%	12,000
July 8th		65%	

She was discharged on a diet of 80 carbohydrates, 50 protein and 180 fat with 40 units of insulin.

A detailed study of the blood was not made in this case.

SUMMARY

1. Two cases of diabetes with coma are reviewed in which there was a definite stimulation of the white blood cells without evidence of infection.
2. This may be explained on the basis of the reaction to organic acids such as beta-oxybutyric acid in high concentration in the blood.
3. The age of the individual might explain the response in the younger individual.
4. Besides the increase of the mature cells of the neutrophilic series there was an increase of the immature cells in the same series to such an extent that the morphological blood picture superficially simulates that of myelogenous leukemia.

CONCLUSION

1. Hyperleukocytosis occurs in diabetic coma.
2. This leukocytosis occurs without a concomitant infection.
3. The leucocytosis may be due to acid bodies.
4. In children the leukocyte count in coma may be higher than in adults.

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THE NAME IS VIOSTEROL

Several preparations of irradiated ergosterol, given for its Vitamin D effect, and christened "Viosterol" by the Council on Pharmacy and Chemistry, are now available on the market. Abroad the product is known by other names, and some distributors are attempting to force the foreign products on the American consumers. Long before anything definite was known as to its actual possibilities for good or harm in the human body, commercial firms attempted, as usual, to get it before the medical profession. When reports of the possible dangers began to appear in foreign medical literature, physicians who were using the product and representatives of the Wisconsin Foundation persuaded the promoters to withdraw the product until dosage and dangers could be established. Then when the time came to release the product again most leading manufacturers agreed to the use of the common name selected by the Council on Pharmacy and Chemistry as the name for the preparations that met its standards. Mead Johnson & Co. of Evansville, Ind., thinking perhaps that its original promotion of its product, Acterol, entitled it to special consideration, has refused to abide by the name chosen by the Council. After careful consideration of all the facts, the Council on Pharmacy and Chemistry decided that the firm had no such claim. Physicians must recognize the necessity for upholding to the fullest extent the Council's decision regarding irradiated ergosterol. If this product is prescribed, the name to be used is "Viosterol" and the brand specified one of those accepted by the Council. Not "Vigantol," not "Acterol," but "Viosterol." (Jour. A. M. A., October 5, 1929, p. 1066.)

MORE MISBRANDED NOSTRUMS

The following products have been the subject of prosecution by the Food, Drug and Insecticide Administration of the United States Department of Agriculture which enforces the Federal Food and Drugs Act: Acid Iron Mineral Compound (A-I-M) (Acid Iron Mineral Percolating Corporation) consisting essentially of a brownish-colored, slightly acid solution of iron, aluminum and magnesium sulphates, with a small amount of phosphates. Allenrhu (Alle-Rhume Remedy Company) consisting essentially of sodium phosphate and sodium sulphate, with small amounts of sodium salicylate and colchicine, some free acid, in a mixture of glycerin and water, flavored with licorice and wintergreen. Nozol (Nozol Company, Inc.) consisting of a heavy petroleum oil, containing menthol and camphor, colored with a red dye. Lane's Cold Tablets (Kemp and Lane, Inc.) consisting essentially of acetanilid, with small amounts of quinine sulphate, camphor and aloin. Asceine (Serra, Garabis and Company) consisting essentially of caffeine, phenacetin (acetphenetidin) and aspirin (acetylsalicylic acid). Zonite (The Zonite Products Company) consisting essentially of a solution of sodium hypochlorite, yielding approximately 1 per cent of available chlorine. Fildrysine (Drug Company) consisting essentially of iodides of potassium and sodium with small amounts of compounds of arsenic and mercury, a trace of berberine, glycerin, alcohol and water. Jayzon's Laxative Cold Tablets (D. C. Leo and Company, Inc.) consisting essentially of acetanilide, with a small amount of cinchona alkaloids and certain extracts of plant drugs, such as aloe, podophyllum and capsicum. (Jour. A. M. A., November 2, 1929, p. 1404.)

THE USE OF SODIUM CHLORIDE IN THE TREATMENT OF VARICOSE VEINS

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THE treatment of varicose veins by the injection method has now practically superseded the older methods of surgical excision. In fact, this method of treatment has been so popularized, especially by Health columns in the daily press, that many sufferers with varicose veins and varicose ulcers are demanding this form of treatment. The injection treatment of veins is becoming so popular that it is absolutely imperative that the medical profession thoroughly acquaint itself with the condition, indications and contra-indications for the treatment, and the technic.

In this treatise we wish to summarize the end-results obtained and the technic used in approximately four hundred injections in eighty cases of varicose veins and varicose ulcers treated since January 1 of this year, and using only one sclerosing agent, namely, 20 per cent sodium chloride solution.

Previous to this time other sclerosing solutions, namely, mercuric chloride, quinine and urea, sodium salicylate, and calorose, were used, but rather aimlessly and without much attempt to follow the results obtained. However, since the first of the year we have kept an accurate account of each case treated, and have systematized our technic, so that it is now much more satisfactory, and we believe the results much more promising.

The injection treatment of varicose veins is by no means a new procedure. It was first introduced in 1851 by Pravatz. In 1894, Delores proved that the results of the treatment were due to the effects of the solution on the intima of the vein rather than to the solution itself. Linzer, Noble and Sicard, on the Continent, have done the most to establish this procedure. In this country, Hayes, and more recently McPheeters, have done much to popularize this method of treatment. Within the past year numerous contributions have been offered.

There are certain types of varices which yield readily to treatment. The isolated varix or the tortuous cavernous mass of varices is ideal for injecting purposes. The small cutaneous dilatations we do not attempt to treat at all. As a rule, they do not cause any symptoms, and the worst that can be said about them is that they are unsightly. We are rather skeptical of those cases where there is a uniform dilatation of the larger trunks of the saphenous vessels. Quite often, especially in men doing heavy work, one finds that all the large superficial veins, not only of the lower limbs but also of the upper extremities, are very prominent. Unless one of these on the lower limb is enlarged out of all proportions it would be better not to attempt obliteration. In two or three cases in which there was a unilateral dilatation of the long saphenous vein, even up to its union with the femoral, a thrombosis has been obtained, but more recently in these cases we have been practising ligation of the saphenous vein at the foramen, with extirpation of the vein to the knee, followed by injections of the tortuous varicosities of the leg. We believe that this is a safer practice, although we do not hesitate to inject either isolated varices or tortuosities on either thigh.

The technic is one which we have established through experience, and one with which we feel we get the best results. In the average case of varicose veins, where the patient is ambulant, one can feel quite certain that the deep venous circulation is competent. We find that it is very seldom that we have to make any special tests to determine the competency of the deep circulation. After a little experience one will get to suspect these cases in taking the history and also on the examination of the limbs. However, if there is any question of the deep circulation it is a simple and safe measure to bind the leg snugly and have the patient walk. If the patient

complains of pain in the leg, injections should not be attempted.

Before the treatment is begun an understanding is had with the patient. It is explained that this will be a course of injections at intervals of three to ten days, and that the treatment will probably extend over a period of from six to twelve weeks.

When the treatment is begun the patient is seated on the end of the table, with the feet resting on a stool. The sites of injection are approximately located. After the tourniquet is applied the patient is asked to lie flat, with the leg elevated even with the body. The site of injection is selected, and this usually the lowermost point of the varices, and the area is sterilized. Then a 20-gauge needle is inserted into the varix, although the size of the needle depends a good deal upon the size of the varix, and blood is then aspirated into the syringe, which usually contains 10 c.c. of the 20 per cent sodium chloride solution. When one ascertains definitely that the needle is in the lumen of the vein, the assistant raises the leg so that it is slightly higher than the body, and after the tourniquet has been released and the veins have collapsed, from 5 to 30 c.c. of the solution are slowly injected, repeatedly making sure that none of the fluid is escaping into the perivascular tissues. Immediately after withdrawing the needle, compression is applied at the site of injection. The leg is maintained in the elevated position. After the cramp subsides (which usually follows each injection, but lasts only a minute or so) a second, or even a third injection may be performed. As a rule, the injections are confined to the varicosities of one leg, and this is continued until the greater part of the vessels are thrombosed before beginning treatment on the other leg. This insures one good leg, as there is usually some discomfort following the development of the thromboses. If 20 to 30 c.c. of the solution are injected at one point this is usually considered sufficient for the day. However, if only 5 or 10 c.c. of solution are injected at one time, three or four of such injections may be completed at one sitting. After the injections are made, a sterile piece of gauze is placed over the points of puncture, and an elastic bandage is applied quite firmly around the extremity, beginning at the foot and continuing to or above the knee, with the leg still in the elevated position. After the bandage is applied the leg is lowered, but the patient is asked to remain quiet for ten or fifteen minutes. The patient is then allowed to be up, and to return home, but is asked to return again in three or four days. Usually at this time, there is quite an extensive thrombosis, which is rather tender, and no more injections are attempted until some of the soreness and pain have subsided.

These treatments are continued then at intervals, gradually working higher and higher on the extremity, until all the varicosities are thrombosed.

In the treatment of varicose ulcers the sclerosing of veins beneath and about the ulcer has usurped all other forms of treatment. This method, combined with immobilization, results in immediate comfort and rapid healing. Frequently there seems to be very little evidence of varicose veins in connection with the ulcer, but careful palpation will almost always disclose veins, either in the bed or at the circumference of the ulcer.

Recurrences of ulcerations are quite certainly due to the fact that some of the varicosities have been missed, and a further search will usually elicit a varix.

The same technic is carried out as described above for the treatment of complicated varices.

After the injection is completed the ulcer is strapped with adhesive, beginning well below and extending well above the ulceration. This is changed every three or four days, and the injections are repeated at intervals, until all the demonstrable varicosities are thrombosed. Almost always, within forty-eight hours after the first treatment, the patient is entirely comfortable and epithelialization can be demonstrated at the margins of the ulcer. Very large ulcers, some half circumscribing the leg, have been healed in this manner.

After healing is complete, the patient is advised to continue to wear a spiral elastic bandage for an indefinite period, merely as a protection and support.

The contra-indications to the injection treatment of veins might be divided into local and constitutional conditions.

The constitutional conditions which might contradict injections are diabetes, marked peripheral arteriosclerosis and pregnancy. In one case, in

the early months of pregnancy, we treated in this manner and got a splendid result, but I believe in general it would be using better judgment to wait until the termination of the pregnancy.

The chief local conditions which might contradict injection are a local infection in an ulceration and a phlebitis. Where infection is present in an ulcer the condition is treated by hot packs until the infection subsides. Where a local phlebitis exists the condition is treated by rest, immobilization, and cold packs. As soon as the phlebitis subsides the remaining varicosities may be injected.

Summarizing the results of four hundred and five injections in eighty-one cases, I have divided the cases into several groups.

In three cases the varicosities had been previously operated and a recurrence developed. Thirteen cases had a complicating varicose ulcer. In twenty-three cases the condition was very extensive, involving both the small and the large saphenous veins. In thirty-six cases there were single groups of nodular varices, and in nine cases a single varix. In every case a good result was obtained, and the patient was well satisfied with the result. In a few cases, especially of the milder types, results were excellent.

This method of treatment, using sodium chloride as the sclerosing agent, is not without its complications. In nine there was quite a marked induration at the site of injection. This complication is undoubtedly due to leakage of the solution through the puncture in the vein wall or due to the fact that the varix is very large and superficial. We have been able to avoid this complication by entering the needle in the skin at a distance from the varix, and traversing quite a thickness of subcutaneous tissue before entering the vein, much in the manner of aspirating a cold abscess.

Six cases developed a marked chemical phlebitis. This was so extensive as to cause a good deal of discomfort. Much of this can be alleviated by rest and the application of cold compresses.

In eleven cases there was some sloughing at the site of injection. In the majority of these cases it was merely a dry slough, which gradually separated and healed over. With experience we have been able to avoid this complication by being absolutely sure of having the needle within the vein. If there is any question the needle is withdrawn without injecting any of the solution. I find that by placing the forefinger of my left hand gently over the point of my needle I can absolutely determine whether the solution is entering the vein or not. When this complication does arise it is evident in a minute, as demonstrable by the blanched appearance of the skin and the bluish-purple irregular border. We feel that it is not a good practice to immediately excise this area. There will be a stinging, burning pain at the site for a period of twenty-four hours, and this will be followed by the development of a dry gangrene, which gradually separates, and the defect slowly fills in with granulation tissue. The immediate injection of the area with hypotonic saline solution is suggested if such an accident should occur.

CONCLUSION

The experiences, the results obtained, and the technic used in four hundred and five injections in eighty-one cases of varicose veins and varicose ulcers, using a 20 per cent sodium chloride solution as the sclerosing agent, are reported.

This sclerosing solution produces a more adherent and extensive thrombosis, giving a more satisfactory end-result. The objections to its use are, first, that it produces a sloughing if allowed to escape outside of the vein wall, and, secondly, that in the majority of the cases it produces a severe cramping pain, which lasts from one to two minutes following injection.

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RHEUMATIC FEVER: A COMMUNICABLE DISEASE*

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DURING the past year there have been eleven cases of acute rheumatic fever among students on the University of Minnesota campus. Five of these were among Farm School students on the Agricultural campus and six among University students on the main campus. All cases occurred within a relatively short period of time, constituting a mild epidemic of this disease. A brief review of the literature shows that epidemics of this kind are not uncommon and each outbreak presents points of clinical and epidemiological interest. This paper is presented particularly from the epidemiological viewpoint.

In order to increase the size of the series and to get more data, a review of cases in students since 1922 is also presented. In all there are thirty-two cases presented here. These were studied in two separate groups for there were more data available from the recent epidemic; but, in summarizing the results, all will be considered together.

CLINICAL AND EPIDEMIOLOGICAL DATA

The age incidence varied from thirteen to thirty-one years, the average being twenty years. There were twenty-nine males and three females. The time in the infirmary varied from 1 to 97 days, the average being about 22 days. These figures, however, do not represent the total duration of disability, as a number of the patients were sent to their homes or transferred to other hospitals. This applies particularly to those who spent only a few days in the infirmary. Four gave a previous history of rheumatic fever.

Fifteen cases occurred among Farm School students on the Agricultural campus and four among Agricultural College students on the same campus. Thirteen cases occurred among all other colleges on the main University campus. These data seem significant, as the Agriculture group forms less than ten per cent of the total University enrollment. This was probably due to several factors. The health habits of this group as a whole are not as good as in the larger University group. More foci of infection are present. Also, this group, coming largely from rural districts, have had fewer previous contacts and less chance for immunity, and on coming to school have a greater degree of segregation and closer contacts due to the fact that most of them live in dormitories, whereas the larger University group live almost entirely in private homes.

The actual clinical course and treatment will not be considered here. Clinically, all of these cases were typical acute rheumatic fever, with or without complications. Treatment was under the supervision of a competent internist, and according to usual prescribed methods. There was one death in the series.

A search for foci of infection was made in each case. In ten cases no focus could be found. In the cases in which foci were found, the tonsils were the probable foci in nineteen cases, teeth in four cases, sinuses in four cases, and osteomyelitis possibly in one case.

Thirteen cases were uncomplicated rheumatic fever. Of the nineteen cases with complications, endocarditis was the complicating factor in fifteen, endocarditis and pericarditis in two, pericarditis alone in one, bronchopneumonia in three, pleurisy in one, acute glomerulo-nephritis in one and old mitral regurgitation in one case.

Thirteen cases were admitted to the infirmary for some other illness a short time before developing rheumatic fever. Some of these may have been a forerunner of or may have initiated the attack. Of these thirteen, seven were in with tonsilitis, four with respiratory infections, one with maxillary sinusitis, and one for submucous resection.

Twenty-seven of the thirty-two cases occurred during the month of January, February, March and April. There were two cases in May, one in June and two in November. These data correspond with those of some of the other series reported in the literature, most epidemics occurring in the early months of the year.

In the five cases occurring among Farm

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School students this year, it was possible to establish contact with known cases of rheumatic fever in each instance. No great significance can be attached to this, however, as there are too few cases from which to draw definite conclusions.

DISCUSSION

A partial review of the literature on the epidemiology of rheumatic fever has been made to bring out more strongly the facts presented in this series. The following points are those of most interest in this relation.

1. *Communicability.*—As early as 1864, Hirsch in his Geographical and Historical Pathology states that "rheumatic fever deserves an assured place among acute infectious diseases." Newsholme in 1895 made an exhaustive study of the known facts and expressed the belief that "rheumatic fever was a specific febrile disease always endemic and at intervals epidemic or even pandemic." Numerous others since that time have studied this problem. Fairly recent articles have been published by Hiller and Graef, Atwater, Mackie, Abeloff and Sabel, Boas and Swartz and others. The general conclusion reached is that rheumatic fever has many of the characteristics of other infectious diseases with a low grade of contagiousness but that at times and under special circumstances it may assume epidemic proportions. Fiessinger, Friedlander, Miller, Swift and others give studies pointing to the possibility that house infections, especially where crowding and unhygienic conditions are important factors, occur in rheumatic fever. Cheadle, Branson, MacCullun, Mantle, Ingerman and Wilson present studies showing the high family incidence. Abeloff and Sabel, Faulkner and White also show that rheumatic fever, like tuberculosis, is to a considerable extent a familial disease, their conclusions from the evidence presented being that families of "rheumatic" patients are more than twice as apt to have another member with a rheumatic infection as families of "non-rheumatic" persons. St. Lawrence observes a higher family incidence for rheumatic fever than for tuberculosis.

In the series presented here the higher incidence in the more closely segregated group of Agricultural students points strongly to the assumption that communicability must have been an important factor. Actual contact with known cases could be demonstrated in almost half of the 1929 cases.

2. *Focal Infection.*—Focal infection in rheumatic fever is still a debatable question. Many prefer that the phrase "portal of entry" be used in its place as it expresses better the real situation. The literature is replete with writings on this subject so only a few will be quoted. Marshall, Houston, Miller, Mackie and many others stress the tonsils as foci of infection. Shaw, Hartzell and others show the importance of oral infections other than the tonsils. Several authors have called attention to other more uncommon foci. Kaiser studied 48,000 children, 28,000 in whom tonsils were removed and 20,000 in whom they were not removed, and concluded that the tonsillectomized child is insured somewhat greater protection against this infection. Ingerman and Wilson believe that tonsillectomy does not by any means always protect against infection, but that other portals of entry must be considered.

In this series tonsillitis in a number of cases and sinusitis in a few cases initiated the attack and were considered as probable portals of entry. In a number of other cases tonsils or teeth were considered to act as foci of infection.

3. *Seasonal Variations.*—A number of the writers previously quoted have called attention to the seasonal occurrence of rheumatic disease. In some localities it is of more frequent occurrence in the spring, while in others it is more common in the fall. In general, the months of March, April and May seem to be the most common.

The early months of the year, January, February, March and April, are evidently the most common in this locality, judging from the material presented.

4. *Age.*—Age incidence is given in almost all of the articles reviewed. Rheumatic fever may occur at almost any age, and is quite common in children, but the highest incidence is given for the ages from ten to twenty.

This age group takes in all of the cases presented in this series.

5. *Geographical Distribution.* — Harrison, Shaw, Clark and others show that this disease is comparatively common in the colder climates and comparatively uncommon in warmer climates, being rare in the tropics.

The climate in this locality seems to be a fairly favorable one for this disease.

6. *Relation to Rainfall.*—A number of writers both in this country and in the British Isles have shown that there is an increased incidence and a higher death rate during the years or months when there is a large rainfall. Several authors have called attention to the fact that rheumatic fever is most common in the British Isles when dampness is common. These facts are interesting but bear no apparent relation to the present series.

7. *Etiology.*—The bacterium which causes rheumatic fever is still a debatable question, both a streptococcus and a diplococcus having been described. Blood cultures were made on three students in the 1929 group by Dr. W. P. Larson of the Bacteriology department of the Medical School. The first two cultures were negative, possibly because they were not taken early enough in the course of the disease. In the third a gram-positive diplococcus was found, which would grow only on yeast extract broth.

SUMMARY AND CONCLUSIONS

1. Thirty-two cases of acute rheumatic fever among students at the University of Minnesota are presented.

2. Nineteen cases or 60 per cent occurred among the relatively small segregated group of students on the Agricultural campus, which comprise less than 10 per cent of the University enrollment.

3. Foci of infection were found in twenty-two cases or 69 per cent.

4. Complications occurred in eighteen or 56 per cent.

5. Twenty-seven cases or 85 per cent occurred during the months of January, February, March, and April.

6. Rheumatic fever is a communicable disease, and seasonal epidemics are not uncommon.

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THE D. A. WILLIAMS QUACKERY

The Dr. D. A. Williams Company of East Hampton, Conn., has been operating a piece of mail-order quackery for many years. More than ten years ago the Bureau of Investigation of the American Medical Association reviewed the history of the concern and brought out that the business had become so extensive that it had given the little village of East Hampton, with a population of less than 1,500 people, a postoffice of the second class! At the time, form-letters sent out by the D. A. Williams concern were signed, variously, "Theodore Flaacks, President," "J. M. Stearns, Manager," and, occasionally, "Dr. E. E. Williams, Medical Advisor." It was also shown that the Dr. D. A. Williams concern had made a practice of selling to letter-brokers the original letters that had been sent to it by prospective victims. It was shown, too, that the preparation sent out by the company for the alleged cure of all "uric acid troubles" was essentially a solution of potassium acetate, colored and flavored with wintergreen. Examination of a specimen sent out by the D. A. Williams concern in October, 1929, indicates that the composition of the nostrum has not changed. Recently the National Better Business Bureau investigated the concern. With the assistance of the Medical Information Bureau of the New York Academy of Medicine, four report blanks were filled out and sent to the Williams Company from different parts of the country to determine whether the company declined to sell its product to those who were suffering from serious ailments. Due to the fact that diagnosis by mail is declared to be unscientific and untrustworthy by medical authorities, pronounced symptoms were indicated. In reply a diagnosis and prescription were returned under the signature of Dr. Wilson Powell, New Haven, Conn. (Jour. A. M. A., November 9, 1929, p. 1493.)

BOROCAINE NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that under the proprietary, non-descriptive name "Borocaine," Sharp & Dohme, Baltimore, market procaine borate, the boric acid salt of the base procaine. The product was placed on the market on the basis of work published by Copeland and Notton, who adopted the name Borocaine to designate the borates of various anesthetic bases with which they experimented and who, according to Sharp & Dohme, gave their approval to the British Drug Houses to manufacture procaine borate under the tile Borocaine. The A. M. A. Chemical Laboratory examined the product marketed as Borocaine and reported that it was the borate of the base procaine —that is, procaine borate. From a study of the literature it was concluded that the procaine borate studied by Copeland and Notton agreed essentially in composition with the procaine borate prepared and described in 1910 by Einhorn and Uhlfelder. Since procaine borate was previously described in the literature, the Council could not recognize the name Borocaine on the score of novelty, and since neither Sharp & Dohme, the British Drug Houses nor Copeland and Notton discovered the therapeutic value of procaine or even the properties of procaine when contained in a solution in which ionization of the procaine salt does not accur, the Council could not recognize the name Borocaine under the clause which permits the recognition of a proprietary name for a previously known substance discovered to have therapeutic value. The Council therefore declared "Borocaine" unacceptable for New and Non-official Remedies because the application of a proprietary name to procaine borate is considered not to be in the interest of rational therapy. (Jour. A. M. A., October 26, 1929, p. 1309.)

CAREFUL OBSTETRICS

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I SELECTED this title, "Careful Obstetrics" because there has been in recent years a renewed interest in maternal and infant welfare and that interest must be maintained by us through reiteration of the principles involved.

The necessity of better obstetric care is shown by the facts that approximately seven in every 1,000 pregnant women die (20,000 die yearly in the United States alone), some 100,000 babies die yearly under the age of one month and every year there occur 100,000 stillbirths. In addition puerperal morbidity due to parturitional injuries, puerperal infection and post-partem hemorrhage often leaves its dire impress in the form of chronic invalidism of the mother. Trauma to the infant, if not sufficient to cause death, often produces permanent defects.

It is generally agreed that the present high mortality and morbidity can be greatly reduced by proper prenatal, natal, and postnatal care. Our greatest advance is shown in lessened morbidity, but fetal and maternal mortality has changed too little during the last twenty-five years.

What factors are responsible for this condition? There is a lack of education of the laity as to what constitutes proper obstetric care. The state as well as the physician should be responsible for the dissemination of this knowledge. Midwifery is still a factor but a constantly decreasing one. There is a great need for better undergraduate and postgraduate instruction and a renewed sense of responsibility by the physician who accepts an obstetric case, thus raising the practice of obstetrics to the dignity of an art, not a sideline in the practice of medicine. Too often there is the feeling that the majority of cases will terminate happily without any attention whatsoever except to be present at labor to tie the cord and Credé the placenta or possibly to end the case abruptly by the inpudicious use of pituitrin or forceps. With present-day ease of communication and transportation, the problem of the rural physician is not different from that of the urban physician. One can practice better obstetrics if there is the will to do it. The only problem is proper remuneration and this is a matter for your medical society to discuss and agree upon.

The best single argument for pre-natal care is the expression of Moreceau, "that pregnancy is a disease of nine months duration." We know that very few women pass through the pregnant state without some disturbance more or less momentous, either physical or psychical. Assuming that the physiologic processes of a normal woman should make proper adjustments to the pregnant state, the majority of women suffer during this attempt with such disturbances as malaise, nervous instability, nausea and vomiting, or exhibit evidence of great physiologic load, by acidosis, glycosuria and albuminuria.

Again her reaction to the pregnant state often results in such marked imbalance as to produce a serious condition such as pernicious vomiting, nephritic or pre-eclamptic toxemia, or true eclampsia.

Prenatal care will disclose these conditions at their inception and with proper treatment will effect a cure in most instances.

The first principle of prenatal care is a careful history. Tuberculosis, insanity, cancer, hemophilia, in the family history is important. Barnes said, "Pregnancy is a test of bodily soundness." Previous diseases may markedly influence the pregnancy, parturition or puerperium. Who has not seen the rickety pelvis, with consequent dystocia; the heart damaged by some infectious disease such as diphtheria, influenza, or articular rheumatism undergo decompensation under the stress of labor; the deleterious effect of pregnancy on tuberculosis which flares up in the puerperium; a chronic nephritis which progresses to a pronounced insufficiency through a toxemia, usually at the end of the second trimester? These cases require the most meticulous care and fine judgment in their treatment.

A history of previous gynecologic operations

*Read at the sixty-first annual meeting of the Wabasha County Medical Society, Wabasha, Minnesota, July 11, 1929.

may be important as to probable complications. The woman who has had an anterior fixation of the uterus is faced with the possibility of miscarriage or dystocia; the one with an amputated cervix with prematurity or dystocia. The one with the over-corrected rectocele may require an episiotomy to prevent laceration into the rectum or fetal death from intracranial hemorrhage, due to pounding of the head on the pelvic floor; the one who has had a previous cesarean section is likely to require at least the new low, extraperitoneal operation.

The venereal question should be put and the presence of infection determined by laboratory tests. Rarely does one find a smear positive for gonorrhea, but stigmata such as infected Skene or Bartholine glands or the so-called gonorrheal macule at the orifice of the latter, are sufficient evidence that the disease exists, and indicate the necessity for energetic treatment. The results from antisyphilitic preparations are next to marvelous in pregnancy.

The history of previous pregnancies as to duration, termination, type of labor, ante-natal and post-natal complications are important. Parturitional accidents such as premature separation of placenta, retained placenta, post-partum hemorrhage often recur and with this information in mind one can be on guard.

Minor symptoms such as nausea and vomiting which 50 per cent of pregnant women have more or less should be all noted. Many women consider this as a normal phenomenon, but if neglected it may develop into a pernicious form. Intravenous glucose with or without insulin prevents many therapeutic abortions which formerly had been necessary to preserve the health or life of the mother.

Symptoms such as headache, blurred vision, and epigastric pain should be investigated. Occurring in the last trimester these complaints have a special significance and may indicate an impending eclampsia. Infections of the nose and throat and particularly of the sinuses is a frequent cause of puerperal sepsis. Caries of the teeth indicate faulty calcium metabolism, which may be corrected by cod-liver oil and sunlight, or alpine lamp. It is now believed that the calcium metabolism at this time has a great influence upon the eruption and development of the child's teeth.

A thorough physical examination is due every pregnant woman. Foci of infection should be discovered and eliminated as far as possible. Thyroid enlargement may require treatment. Tuberculosis healed or active may require therapeutic abortion. Cardiac disease is an indication for constant vigilance and treatment and may require therapeutic abortion or, if seen late in pregnancy, cesarean section under local anesthesia. Bimanual examination in the early months may reveal a retroversion which if not corrected spontaneously or manually might become incarcerated and result in an abortion and sepsis. Tumors of the uterus of ovaries may be found. Varicosities of the extremities, aside from their unsightliness, produce aching legs and invite thrombophlebitis during the puerperal period. Elevated blood pressure, taking 130 as the upper limit of normal, points toward a developing toxemia even before albuminuria is present.

The average physician will not take pelvic measurements. There is no excuse for the neglect of such a simple but informative procedure.

The determination of the presentation and position of the fetus during the last trimester will at times allow a malposition to be corrected before labor.

Finally the mother should be supplied with information such as is given in the pamphlet, "Prenatal Care," furnished by the U. S. Department of Labor, which gives her information in simple terms regarding hygiene suitable for the pregnant state and in addition information concerning the care of the baby.

The patient should visit her physician every three weeks for the first six months, every two weeks thereafter, furnishing a specimen of urine every week during the last six weeks. At these visits, weight should be recorded, adverse symptoms noted, blood pressure readings taken, urine examination made and the condition of the fetus ascertained.

Only by proper prenatal care can many of the complications of childbirth be prevented. Our greatest opportunity lies in the prevention of fetal deaths, 34 per cent of which are due to syphilis and 72 per cent to syphilis, dystocia, toxemia and prematurity in the order named. Polak says, "Conscientious pre-natal care could obviate the death of one-half of the children who now die within the first month of puerperium." If so, 50,000 children are needlessly sacrificed each year.

Adequate care during labor is not often obtained. This is due to many causes: economic, the exigencies of medical practice, insufficient training, the personal equation involving conscientiousness, skill and niceties of judgment. Obstetrics is the poorest paid portion of medical practice, but it should be and is the most gratifying. Many obstetricians claim that obstetrics is a surgical specialty. While it is true that surgical efficiency is a necessary qualification of a good obstetrician, the bulk of obstetrics will always be done by the general practitioner. His dearth of surgical ability can be offset by conscientious effort with the skill that he possesses.

The one greatest need of the woman to be confined is her share of our time—the very thing we have the least of. There is no comparison between the results obtained by "hit and run" obstetrics and that obtained by adequate supervision.

The woman in labor and the fetus are beset with dangers more fulminating and immediate than the acute surgical case.

In the conduct of labor lies our greatest opportunity to change the existing figures of morbidity and mortality of the mother and child. Here the information gained by the prenatal care becomes valuable especially with regard to the blood, heart, lungs, kidneys and bony pelvis. Often we can predict the complications likely to arise in a particular case and be prepared to meet them. By observing the character of the contractions we can stop ineffectual ones by morphin, stimulate them by pituitrin or control them by anesthesia, of course giving due consideration to the stage of labor and anomalies of the child, passages and bony pelvis. The first essential is to know the position of the fetus. This is obtained by abdominal palpation and confirmed by rectal examination. The condition of the fetus should be noted at regular intervals particularly during the second stage. Rectal examination is a most satisfying diagnostic procedure and will eliminate vaginal examinations in 80 per cent of labors. With it can be determined the presence or absence of engagement, the condition of the cervix, the amount of forewaters and progress of labor.

Rigid asepsis should be maintained, as puerperal infection is the greatest cause of maternal morbidity and mortality. The parturient tract may be considered as an open wound and sepsis as a wound infection. Vaginal examinations, injudicious use of forceps, ill-advised intra-uterine manipulation, the fads of obstetrics, such as Potter's version and early forceps, help to maintain that 40 per cent of maternal deaths which are due to infection.

"More women die from accidents of the third stage than the other two combined." Post-partum hemorrhage is a fearful emergency. It may be insidious or acute and requires watchfulness, accurate estimation of blood loss, quick judgment and energetic treatment. The placenta should be given time to separate, should be Credéd gently, and examined thoroughly. Retention of a piece of placenta often produces sepsis and retention of membranes, sapremia and prolonged convalescence.

Strenuous methods in the resuscitation of the child should be avoided. Usually the child does not get his share of post-natal attention. The fact that as many children die in the first month as in the next eleven months deserve our consideration. Deaths are sometimes due to an enlarged thymus, which is remediable, or to congenital heart, which, while not curable, brings humiliation if not diagnosed.

The post-natal comfort of the mother is often neglected. Aseptic technic should be continued and applied to the breasts, treating fissures which if persistent may result in breast abscess. Persistent lochia rubra and frank hemorrhage should be controlled. Every effort should be made to locate the source of any fever and the perineal repair should be inspected.

Obstetrics, which should be an art, is a neglected branch of medicine both in its teaching and its practice. Education of the laity as to the value of pre-natal care, more undergraduate and postgraduate instruction, and conscientious usage of the knowledge that the practising physician now possesses will prevent a large percentage of the cases resulting in chronic invalidism and untimely death.

609 LaSalle Bldg.

CASE REPORTS

ULCUS RODENS OF RIGHT EYE TREATED BY A CONJUNCTIVAL FLAP OPERATION

REPORT OF CASE

ARTHUR C. DEAN, M.D., F.A.C.S.
Hot Springs Clinic
Hot Springs, South Dakota

De Schweinitz describes ulcus rodens or chronic serpiginous ulcer of the cornea, as it is sometimes called, as a creeping ulcer which begins usually at the upper edge of the cornea as a superficial lesion separated from the healthy portion by a gray, opaque rim, which is usually undermined. The deeply undermined conjunctival edge of the ulcer is a striking feature. Vessels may pass to this ulcer and cicatrization apparently begin, but it relapses quickly and may spread until the whole cornea is traversed and sight is destroyed. The cornea is not usually perforated. The process may last from two to ten months or longer. The etiological factor has not been determined. The involvement seems to be limited, almost always, to the superficial layers of the cornea, according to Feingald. Prognosis is unfavorable. The treatment consists of relief of the pain and photophobia. The use of atropine and dionin, antiseptic Collyria in the cul-de-sac, hot compresses, or powdered calomel is indicated, and even paracentesis, curettage, conjunctival flaps, foreign protein injections, etc., may be resorted to if the earlier measures fail. Any evidence of focal infection in the teeth, tonsils, or sinuses should be attended to.



Fig. 1. Appearance of the eye on admission.

CASE REPORT

Mrs. E. F. came into the office on June 14, 1928, complaining of a soreness and redness of the right eye, which had become progressively worse for the past



Fig. 2. Schematic drawing of the condition of the eye on admission.

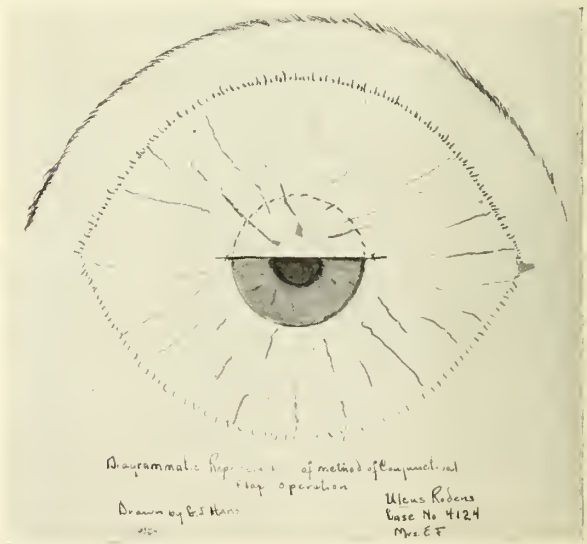


Fig. 3. Diagrammatic representation of the method used in the conjunctival flap operation.

four weeks. She had been treated by her local physician without any improvement. There was edema and ptosis of the right lid, marked lacrymation and photophobia. The right pupil was irregular and partly dilated. The tension was not increased. The vision was: right eye 20/200, left eye 20/20. There was an ulcer near the limbus in the eleven to one o'clock portion extending four millimeters towards the center of the cornea. The edges of this ulcer were undermined and the floor presented a dirty, scooped-out appearance. There were new blood vessels extending from the conjunctival edge and the ocular conjunctiva was injected over a triangular area with the ulcer as an apex. There was a mottling of Descemet's membrane and the iris was of a dirty, grayish appearance. The cornea was hazy, and the view of the fundus was indistinct.

General examination revealed no abnormalities. The patient was four months pregnant, the urine and blood were normal. The blood Wassermann was negative. *X*-ray of sinuses showed a very low grade chronic ethmoiditis. Teeth and tonsils were not diseased. Eye culture was positive for staphylococcus and pneumococcus. The patient was hospitalized and atropine instilled into the eye. Hot compresses were used and the ulcer was curretted. Calomel was applied to the ulcer locally. Boiled milk was injected into the gluteal muscles until a good reaction was obtained.

This treatment was continued six weeks and the eye did not show the expected improvement. For this reason it was decided to do a conjunctival flap operation. The method of Kuhnt was used as illustrated in the accompanying diagram. The flap was left in place five days and then removed. The ulcer healed rapidly from that time on, and three weeks later the patient was discharged with 20/30 vision in the right eye.

POPLITEAL ANEURYSM

REPORT OF CASE

A. E. Olson, M.D.
Duluth, Minnesota

The patient, G. E., seventy-four years of age, had been ill acutely four days before coming under our care.

Present Complaint.—

1. Pain, sudden and severe in left knee and leg.
2. Coldness and numbness of left extremity below the knee.
3. Swelling and discoloration of left leg.

Onset and Course.—The patient had noticed a pecular heavy lagging sensation in the left leg for the past year. He had not given this any particular attention because he did not have distress or pain and had worked as usual.

On June 12, 1929, he made a long trip by auto, driving almost continuously fourteen hours. On arriving at his destination, he stepped from the car and was suddenly seized with a very intense pain in the left leg from the knee down. He buckled and fell to the ground. The pain continued for three hours and was so severe that he was completely exhausted. The leg then became cold and lifeless. The next day hot packs were applied, the leg swelled, the skin blistered and the tissues turned black and blue below an area extending from the middle of the thigh. A physician was called and a tight bandage was applied covering the whole area. The patient returned to Duluth and entered the hospital on June 16, four days after the onset.

Past History.—The patient had never been sick and had not previously consulted a physician, although he had marked hemorrhoids and an almost complete prolapse of the rectum when first examined.

Examination.—The patient when first seen by me seemed very ill. He was weak and irrational at times. He was quite well nourished. The pulse was 88, temperature 100.2, respirations 20, blood pressure 128/94.

General examination was negative except for the rectal condition mentioned above. The essential pathology centered in the left leg below the knee and extending to the middle of the thigh. The limb below this area was markedly edematous and was blue-black in color. There was superficial sloughing of the skin. There was complete loss of sensation and a motor paralysis in the involved area. No vascular pulsation was noted except in the upper third of thigh.

Treatment.—Preoperatively, this was supportive and included a blood transfusion. A high thigh amputation was performed on June 20, eight days after the onset. Spinal anesthesia was used and outside of another transfusion, the postoperative treatment and course were uneventful.

Pathological Report.—"A fusiform aneurysm of the popliteal artery, measuring 3.2 cm. in diameter and 9 cm. in length. It involved a general dilatation of all the coats of the vessel and all visible orifices of collateral or other branches were obliterated.

"On dissection, the femoral artery for a distance of 16 cm. above the popliteal space contains a friable clot. The walls are markedly thickened and sclerosed. The intima is broken in several places. The sac is filled with a clot organized at the periphery, gray in color. Through its center there is a dark reddish-brown clot, apparently more recent and filling a canalized tube.

"Over the lower two-thirds of the sac, the intima and part of the media is dissected away and peels off with the clot. The wall of the sac measures as much as .6 cm. in thickness. The femoral and popliteal divisions of the vein are closely attached to the aneurysm by dense adhesions. The vessels are all thrombosed in the involved region."

Diagnosis.—Popliteal aneurism with thrombosis.

The possibility of cure, had the patient sought treatment earlier, is doubtful. The blood Wassermann was negative. In this type of fusiform aneurysm only obliterative aneurysmorrhaphy can be performed where the walls are so degenerated (Matas operation). It is improbable that collateral circulation could then be established.

SUMMARY

This case is of interest because the symptoms of the onset were those of an embolus causing complete and immediate obstruction in the popliteal artery. Also, the patient, seventy-four years old, with the usual senile changes, recovered from high amputation of the thigh under spinal anesthesia, an operation which entails considerable shock.



S. H. Boyer, M.D.
President, Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

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Vol. XIII January, 1930 No. 1

OPINION CONCERNING SAFETY OF SPINAL ANALGESIA

The feasibility of spinal analgesia in surgery was suggested by Corning in 1885 and the first practical application of the method was made by Bier, of Kiel, in 1899. These facts are well known now. Considering the time that has passed since the pioneer work, however, one might expect, concerning the value of spinal analgesia, more unity of attitude among surgeons than seems to exist.

Lundy, whose attitude toward the method has been conservative, writes as follows: "With the close of 1928 it seemed that the severity of the untoward reaction which had been observed previously in spinal anesthesia had decreased, as had the frequency of such reactions, so that the problem which gives the most concern now is that of increasing the period of anesthesia and of retaining safety."

Insufficient duration of analgesic effect is a serious fault, certainly. According to Labat, "one hour is the average time available for operation." Nevertheless, some internationally known surgeons, whose work consists mainly of pelvic operations which they perform as a routine in less than a hour, will not employ spinal analgesia. The reason, perhaps, is that the memory of previous untoward reactions has remained with them and they are not convinced of the safety of the method. Their experience and the responsibility they carry make their opinion worthy of respect. Many anesthetists, however, believe these surgeons to be wrong and they have worked out a number of safeguards which undoubtedly have reduced the hazard.

First of these, in the minds of some, is the experience of the person who administers the anesthetic and whose special care it is, throughout the operation and after the patient has returned to bed, to see that the anesthetic does no harm. More emphasis is placed on experience with some method than on the use of any particular method.

Selection of the drug to be injected has been narrowed considerably by recent experience. Procaine has been widely accepted as having the minimum of toxic effect. Moreover, with the knowledge that has been acquired concerning the use of barbiturates in combating the toxicity of procaine, particularly concerning the use of iso-amylethyl barbituric acid, an added factor of safety is at hand.

In the method of injection are factors of danger or of safety. A needle of medium gauge, preferably of nickel, with a short bevel and with an accurately fitting stylet is used. Formerly, spinal fluid was withdrawn before the analgesic solution was injected. At present, only enough

fluid is taken to dissolve the drug that is used. The injection is made slowly, under only light pressure; in this way diffusion of the solution is prevented and the analgesia is better localized.

Of supreme importance is the position of the patient after the injection has been made. The patient should be placed in the Trendelenburg position and should be kept there for at least three hours after he has been returned to bed. With the head lower than the pelvis cerebral anemia is diminished, and it has been claimed that acute cerebral anemia, rather than diffusion of the analgesic to the respiratory center, is the cause of death during spinal analgesia.

The blood pressure tends to fall in spinal analgesia. Formerly, injection of caffein and strychnine tended to combat this. At present, ephedrine is used with better effect. Lundy is convinced of the value of inhalation of oxygen and of pulmonary ventilation in combating anoxemia, and, in 1928, he reiterated his former statement, "If anoxemia is avoided, death under spinal anesthesia may be prevented."

Now that these factors of safety have come into use and that attention is being directed to retaining safety and to lengthening the period of analgesia, it will be interesting to watch statistics from medical centers of the next few years to see if the proportion of operations under spinal analgesia increases.

R. M. Hewitt, M.D.

SUGGESTED CRIME

Some two years ago the writer commented in these columns upon the contagion of suicide; the serious menace of repeated suggestion lent emotionally unstable folk by the appearance in our news sheets of minute details of suicides, their motives, methods and sequences. A notably conspicuous and ghastly double tragedy has occurred in our vicinity recently, supporting the same contention. Within a few weeks press dispatches from France featured a very unusual trial: an instance of matricide, in which the son shot his mother because of her age, suffering and incurability. A French jury set him free. These accounts were not only featured in the papers, but they were followed up by a series of interviews with notables in various countries, securing expressions of approval or disapproval. Suffice it to say that the jury had enough distinguished support from those who would likewise yield to the young man "the position of judge, jury and executioner"—not to mention temporal control of the divine spark of life—so that they need not have felt lonely on their emotional island.

Thanks to our amazing knitting together of the world, and our ever increasing interdependence, it is difficult to dissociate these newspaper accounts from the northern Minnesota sequel. In brief, it was the shooting to death of a seventeen-year-old victim of a devastating birth palsy —with all its succeeding faulty developments— and the suiciding of an overwrought father. The details can easily be surmised—a helpless child— a thoughtful, indulgent and provident father—a search for causes, remedies, or reasons back of it all—result, futility.

And yet, there were two other lovely children in the family, and a little city full of their equals; why so little glory in the fulfillment of the many because of the grief for the blighted one!

The curtain usually drawn over such a glimpse of the awful potentiality of the human consciousness is that such an act was the result of an unsound mind. The medical opinion will vary, but for the most part it would be a negative one. The irrational mind does not deliver so much courage. It is said that each of us is a personality mosaic, made up out of all our life contacts. These are no longer unit affairs, man to man; the printing press and a thousand agents designed to keep it busy have multiplied the complexity of this mosaic. The press will publish that which is news—always. To those behind the press—who obviously believe so wholeheartedly in advertising and repetition—why is so much repetition used in these suicidal and homicidal stories? Did you notice that recently a long viaduct near Los Angeles was patrolled to prevent an epidemic of jumpers after one had shown the way?

E. L. T.

HISTORICAL COMMITTEE

Medical men have often done many things outside their profession. Many have abandoned medicine for business, some have written poetry and others have entered politics and what not. Who was the President of the United States who studied medicine? Since no president of the United States, so far as I know, ever lived in

Minnesota, you will not find anything about this in our forthcoming book.

To return to the original subject—the man I have in mind entered the army after practising medicine for twenty years, as a Captain of Infantry; was discharged from the service as Brigadier General and then resumed the practice of medicine and followed it for twenty-one years longer.

When your History of Medicine in Minnesota is completed, you may read about him and many others who served in the civil war. Please forward to Dr. Workman whatever scraps of Minnesota Medical history you may be able to supply.

J. M. A.

MISCELLANEOUS

UNLICENSED CANCER SPECIALIST CONVICTED OF PRACTISING HEALING WITHOUT A BASIC SCIENCE CERTIFICATE

Boyd T. Williams, owner and operator of a Cancer Sanatorium, at 525 University Avenue S. E., Minneapolis, Minnesota, was convicted October 31, 1929, by a jury in the District Court of Hennepin County, on a charge of practising healing without a Basic Science Certificate. The evidence showed that on or about September 11, 1928, one Mrs. Sophie Weisskirch was operated on at the Williams' Sanatorium for the removal of an alleged cancerous right breast. The evidence showed that on the day previous Mrs. Weisskirch had been examined by Dr. Williams and her ailment diagnosed as cancer.

Previous to Mrs. Weisskirch's going to the Williams Sanatorium, she had received a letter and catalog from Dr. Williams in which she had been informed that small cancers could be cured in a few hours, and large cancers in from seven to nine days.

Mrs. Weisskirch is still receiving medical attention because of the unhealed condition of her body following the above removal of her right breast. She paid Dr. Williams a fee of $300.

The validity of the law was attacked during the trial and also the regularity of the appointments made by Governor Christianson to the Basic Science Board.

The Court overruled the defendant's objections, upholding the law and the appointments of the Board members, the Court's ruling being in direct opposition to the rulings made by the Court in Pope County in the case of State of Minnesota vs. Robert McGraw.

The case attracted quite a number of people and among those present were persons frequently seen at the State Capitol during the 1929 session of the Legislature.

On Monday, November 4, 1929, the Court imposed a fine of $250.

It was disclosed, during the trial, that the defendant was convicted on his plea of guilty in 1913 to practising medicine without a license and was fined $50; also that the defendant was convicted in 1928 on his plea of guilty to a violation of the Basic Science Law, at which time he was fined $100.

The investigation of the case was handled by Mr. Bris on behalf of the State Board of Medical Examiners. The trial and upholding of the Basic Science Law was handled by Mr. Skahen and Mr. Larson of the Hennepin County Attorney's office.

On November 22, 1929, a motion for a new trial was presented to Judge Baldwin in the above entitled matter. Following lengthy arguments and the furnishing of briefs on both sides to the Court, the motion was denied on December 3, 1929.

COMMUNICATION

To the Editor:

Dr. Lewis F. Smead, Chairman of our Board of Trustees, reports that a young man has been traveling throughout the country representing himself as "Lewis F. Smead, Jr., interne at Hopkins." This individual obtained sums of money from Dr. Smead's classmates in Duluth, Minnesota, and Helena, Montana.

Would it be possible for you to run a notice in the Journal of the Minnesota State Medical Association warning physicians to be on the look-out for this imposter? Dr. Smead has no son by the name of Lewis F., Jr. Any help you can give toward stopping this fraud would be appreciated by our Dr. Smead.

Very respectfully yours,

Wm. J. Burns,
Executive Secretary,
The Academy of Medicine,
Toledo, Ohio.

UNGUENTUM CARBONIS COMP. (HILF) NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Unguentum Carbonis Comp. (Hilf) is marketed by the Hilf Products Co., Brooklyn, and that it is claimed to contain an alcoholic extract of crude coal tar, representing from 2 to 2.5 per cent of "its active constituents," menthol and thymol, each 2½ grains to the ounce; eucalyptol, 5 minims to the ounce; salicylic acid, 2 per cent; in a base consisting of kaolin and "boroglyceride" (equivalent to 10 per cent of boric acid). The Council declared Unguentum Carbonis Comp. (Hilf) unacceptable for New and Non-official Remedies because it is a needlessly complex and therefore unscientific mixture, which is marketed with unwarranted therapeutic claims and under a name which is insufficiently descriptive of its composition. (Jour. A. M. A., November 23, 1929, p. 1649.)

President's Letter

DURING the past several years the organization of the Minnesota State Association has progressed amazingly. The effect of this progress has been most noticeable in the field of political prestige, which has in turn excited the admiration of the societies of other states and that of the national association itself. This near spectacular advance has tended to obscure other evidences of constructive work. Therefore the attention of the profession should be drawn to other and no less important activities.

Today we hear much of the menace of state medicine, of the activities of lay bodies in the interest of both public and private health, of free clinics of various sorts, and we ponder upon what is happening and upon our own position in this confusing maze. We find ourselves wondering what the state society may be doing to interpret these many activities and to meet a situation tending possibly to engulf the profession within the meshes of socialism. What is upon us is just this: The public is alive to the importance of both preventive and curative medicine; through its lay organizations it is seeking to promote health and to combat sickness; in its zeal it is apt to work a grave injury to the medical profession, the instrument upon which it leans most heavily for the success of its efforts. We cannot turn this movement back, it is too tremendous, and we would not if we could. It is but a part of the onrush of our civilization.

Our duty is plain. It is to understand the nature and purpose of this movement; to lend wise counsel; to give coöperation in the promotion of that which is good; to exercise, through reason and persuasion, a restraining and guiding influence wherever it may be needed. The state society at this time is so organized as to give this matter proper attention. Through its committees now functioning a great deal is being done. These committees are well calculated to meet the issue wisely and scientifically. Most of our committees overlap in function in some degree and desirably so. Their memberships should interlock. They must function, not as independent bodies, but as a unit. The chairmen of these standing committees must meet, not once, but often. These committees serve as a means of contact between the medical profession and the various public health movements, both official and unofficial. They develop and execute methods of carrying health knowledge to the public and scientific extension service to the profession. Thus these committees promote and correlate our practical business and scientific interests.

Civilization and organization are interdependent. The former falls without the latter while the latter is selfish and oppressive without civilization. Every member of the medical profession in Minnesota should belong to the local, state and national organizations. The strong individualism of the physician has militated greatly to retard professional organization and progress. *But now the time has come when this individualism must be merged with the common interest if the profession is to escape subserviency.* Let all join in enthusiastic effort to fulfill our true function as physicians. We shall be worthy of the admiration of other professional bodies, of the respect and confidence of the people we serve and of our own esteem only as our organized strength and influence are used wisely and for the public good.

S. H. Boyer

President,
Minnesota State Medical Association.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of January will be as follows:

January 1—"Holiday"

January 8—"The Cause and Prevention of Bunions"

January 15—"Health and Safety"

January 22—"Our Present Knowledge of Infantile Paralysis"

January 29—"Preventable Blindness"

AMERICAN COLLEGE OF PHYSICIANS

The annual clinical session of the American College of Physicians will be held in Minneapolis Monday to Friday, February 10 to 14, 1930. Headquarters will be at the Auditorium.

Monday morning will be devoted to registration and each morning thereafter to clinics by visitors and local physicians at the various hospitals. Scientific sessions will occupy Monday and Tuesday evenings while a convocation and smoker is scheduled for Wednesday evening and a banquet for Thursday evening.

Members of the Minnesota State Medical Association are invited to attend the sessions.

Dr. S. Marx White is chairman of the local committee on arrangements. Special provision is being made for the entertainment of visiting ladies.

The morning clinics are not published in MINNESOTA MEDICINE but the following scientific program scheduled for the afternoons and evenings at the Auditorium gives a good idea of the type of program to be presented.

PROGRAM

MONDAY, FEBRUARY 10, 1930

OPENING SESSION, 2:30 O'CLOCK

1. Addresses of Welcome
   LOTUS DELTA COFFMAN, President of University
   ELIAS P. LYON, Dean of University of Minnesota Medical School.
   EDWARD L. TUOHY, Duluth, President of the Society of Internal Medicine
   S. H. BOYER, Duluth, President of the Minnesota State Medical Association.
   E. L. GARDNER, Minneapolis, President of the Hennepin County Medical Society
2. Reply to Addresses of Welcome
   JOHN H. MUSSER, JR., New Orleans, President of the American College of Physicians
3. Colloids in Medicine
   ROSS A. GORTNER, University of Minnesota
4. Cerebral Localization
   LEWIS J. POLLOCK, Chicago
5. The Psychological Panel in Diagnosis and Prognosis.
   WALTER FREEMAN, Washington, D. C.
6. Gastro-Intestinal Troubles that Now Go Undiagnosed
   WALTER C. ALVAREZ, Rochester, Minn.

EVENING SESSION, 8:00 O'CLOCK

1. Latent Hyperthyroidism Masked as Heart Disease
   SAMUEL A. LEVINE, Boston
2. Observations on the Etiology of Gall-Stones
   A. C. IVY, Chicago
3. The Significance of Atelectasis in Bronchopulmonary Conditions
   FREDERICK T. LORD, Boston.
4. Moving Pictures of the Results of Stramonium Treatment in Encephalitis
   FREDERICK EPPLEN, and (by invitation) A. L. JACOBSON, Seattle

TUESDAY, FEBRUARY 11, 1930

AFTERNOON, 2:00 O'CLOCK

VASCULAR DISEASE

1. The Effect of Generalized Arteriosclerosis upon the Heart and the Systemic Circulation
   GEORGE E. FAHR, Minneapolis
2. Some Newer Aspects in the Problem of Essential Hypertension
   NORMAN M. KEITH and JAMES W. KERNOHAN, Rochester, Minn.
3. The Retinal Vascular Changes in Hypertension
   HENRY P. WAGNER, Rochester, Minn.
4. Arteriosclerosis in Diabetes
   ELLIOTT P. JOSLIN, Boston
5. The Relations of Arterial Sclerosis and Renal Disease
   ALFRED STENGEL, Philadelphia
6. The Causes of Arterial Hypertension
   E. T. BELL, Minneapolis
7. The Management of Hypertension
   JAMES S. MCLESTER, Birmingham
8. The New Possibilities in Classification and Treatment of Anemia
   HILDING BERGLUND, Minneapolis
9. Cinematomicrographic Demonstration of Human Intestinal Protozoa. Pictures and Remarks on their Biology, Pathology and Treatment
   JOHN V. BARROW, Los Angeles

EVENING, 8:00 O'CLOCK

1. History of Syphilis
   JOSEPH L. MILLER, Chicago.
2. History of Certain Medical Instruments of Precision
   LOGAN GLENDENNING, St. Louis
3. Spontaneous Pneumothorax, Non-tuberculous
   F. J. HIRSCHBOECK, Duluth, Minn.

4. The Healing of Tuberculosis, Illustrated by Films and Slides
   Francis M. Pottenger, Monrovia, Calif.

WEDNESDAY, FEBRUARY 12, 1930
AFTERNOON, 2:00 O'CLOCK

1. Splenic Puncture as a Diagnostic Procedure in Infancy and Childhood
   Julius H. Hess, Chicago
2. I. Diagnostic and Physiologic Studies in Certain Forms of Scleroderma
   George E. Brown and Paul A. O'Leary, Rochester, Minn.
   II. Surgical Indications and Operative Results in the Treatment of Vasospastic Types of Scleroderma with Sympathetic Ganglionectomy.
   A. W. Adson, Rochester, Minn.
3. Sympathectomy in Polyarthritis
   Leonard G. Rowntree, Rochester, Minn.
4. The Relation of Experimental Rheumatoid Inflammation to Allergy
   Benjamin J. Clawson, Minneapolis
5. In Defense of the Stethoscope
   James B. Herrick, Chicago
6. Rectal Temperature Curves; Normal and Abnormal
   William B. Breed, Boston
7. The Limitations of Heliotherapy in Pulmonary Tuberculosis
   Bernard L. Wyatt, Tucson
8. Résumé of Our Present Attitude Regarding Iodine in the Treatment of Toxic Goiter
   James H. Means, Boston
9. Unusual Addison's Syndromes
   A. B. Brower, Dayton, Ohio
10. A New Method for the Treatment of Pellagra
    Clyde Brooks, University, Alabama
11. Multiple Polyposis of the Colon
    J. A. Bargen, Rochester, Minn.

EVENING, 8:00 O'CLOCK
CONVOCATION OF THE COLLEGE

The General Profession is cordially invited. No special admission tickets are required.

1. Convocation Ceremony
2. President's Address
   John H. Musser, Jr., New Orleans

The Smoker will follow the Convocation exercises, after a brief intermission. An attractive program has been arranged .

THURSDAY, FEBRUARY 13, 1930
AFTERNOON, 2:00 O'CLOCK

1. Symposium on the Biology of Cancer
   The Etiology and Biology of Cancer
   Leo Loeb, St. Louis
   The Nature of Heredity in Animals
   H. Gideon Wells, Chicago
   Heredity of Cancer in Man
   Aldred Scott Warthin, Ann Arbor
   The Principles of Radiation Treatment
   Francis Carter Wood, New York
2. Undulant Fever in California
   J. Edward Harbinson, Woodland, Calif.
3. Undulant Fever: A Clinicopathological Study
   Walter M. Simpson, Dayton, Ohio
4. Curing the Ulcer Patient
   Seale Harris, Birmingham

The General Business Meeting of The College will be held at 4:00 o'clock in the Auditorium. All Masters and Fellows should attend.

EVENING, 7:00 O'CLOCK
The Curtis Hotel
THE ANNUAL BANQUET OF THE COLLEGE
A Dance will follow the Banquet.

FRIDAY, FEBRUARY 14, 1930
AFTERNOON, 2:00 O'CLOCK

1. Some Observations of Functional Diseases of the Alimentary Tract
   William Gerry Morgan, Washington, D. C.
2. Remarks on Chronic Infections
   Allen K. Krause, Tucson
3. Symposium on the Rôle of Surgery in Pulmonary Tuberculosis
   Pneumothorax
   James Burns Amberson, Loomis, N. Y.
   Pneumolysis
   Ralph C. Matson, Portland, Ore.
   Multiple Intercostal Neurectomy and Phrenicectomy
   John Alexander, Ann Arbor
   Thoracoplasty
   Philip King Brown, San Francisco
   General Considerations of the Rôle of Surgery in Tuberculosis
   Gerald Webb, Colorado Springs
4. The Diagnosis of Pre-Clinical or Latent Tubercle by Caulfield's Inhibitive and the T. C. F. (with Lantern Slides of Chests and Graphs)
   W. E. Ogden, Toronto
5. A Diagnostic Triad in Syphilitic Aortitis
   C. Saul Danzer, Brooklyn

HOUSTON-FILLMORE MEDICAL SOCIETY

The annual business meeting of the Houston-Fillmore Medical Society was held at Rushford, Minnesota, Oct. 24, 1929. A dinner was served at the home of Dr. R. V. Williams, after which an interesting talk was given by Dr. J. M. Hayes of Minneapolis. At the business meeting the following officers were re-elected: Dr. R. V. Williams, president; Dr. G. B. Belote, vice president; Dr. J. W. Helland, secretary; Dr. J. C. Lannin, treasurer; Dr. R. V. Williams, delegate.

The Women's Auxiliary held their annual meeting at the same time.

A vote of thanks was given Dr. Hayes for his talk and to Dr. and Mrs. Williams for the dinner.

J. W. Helland, M.D.,
Secretary.

SECRETARIES' CONFERENCE

The Secretaries' Conference will be held at the St. Paul Hotel, St. Paul, Minnesota, on January 11, 1930, beginning at 9:30 a. m. The conference this year promises to be one of unusual interest and it is important that all secretaries be present. The Lay Health Program of the St. Louis County Medical Society, The Community Hospital and its Original Staff, Malpractice Insurance and its Relations to the Hospital and its Personnel, Storage of *X*-ray Films, Public Health Nursing Standards and the Heart Disease Campaign are some of the subjects to be discussed.

MOWER COUNTY MEDICAL SOCIETY

At the annual meeting of the Mower County Medical Society held December 5 the following officers were elected:

President ..... Dr. J. G. W. Havens, Austin
Vice President ..... Dr. P. A. Lommen, Austin
Secretary ..... Dr. C. L. Sheedy, Austin
Treasurer ..... Dr. A. E. Henslin, LeRoy
Delegate ..... Dr. J. G. W. Havens, Austin

RAMSEY COUNTY MEDICAL SOCIETY

At the annual meeting of the Ramsey County Medical Society held November 25, 1929, the following officers were elected:

Dr. Fred Schuldt—President
Dr. Charles Freeman—Vice President
Dr. Albert Schulze—Secretary-Treasurer
Dr. Frank E. Burch—Member Boeckmann Library Building Fund

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The Southwestern Minnesota Medical Society met at Slayton, Minn., Nov. 5, 1929, for their annual meeting. Dr. W. E. Patterson, Westbrook, Minn., was elected president; Dr. E. W. Arnold, Adrian, Minn., vice president; Dr. E. G. McKeown, Pipestone, Minn., Secretary-Treasurer. Mr. F. M. Brist, Saint Paul, was the speaker for the evening.

STEELE COUNTY MEDICAL SOCIETY

The annual meeting of the Steele County Society was held at Owatonna, November 19, Dr. E. J. Nelson, vice president, presiding.

Officers elected for the coming year were:

President ..... Dr. E. J. Nelson
Vice president ..... Dr. J. A. McIntyre
Secretary ..... Dr. A. B. Hart
Treasurer ..... Dr. J. F. Smersh
Censors ..... Dr. E. W. Senn, 1 year
Dr. T. C. Quigley, 2 years
Dr. B. Melby, 3 years

Delegate to the State Medical Association, Dr. A. B. Stewart; alternate, Dr. J. A. McIntyre.

Dr. J. T. Christison, president of the State Association, addressed the Society following the business meeting.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry.

CURDOLAC FOOD CO.
- Curdolac Soya Flour
- Curdolac Casein-Bran Improved Flour
- Curdolac Soya-Bran Flour
- Curdolac Breakfast Cereal
- Curdolac Casein Compound
- Curdolac Wheat-Soya Flour
- Curdolac Soya-Cereal Johnny Cake Flour
- Curdolac Soya-Bran Breakfast Food

CUTTER LABORATORY
- Ampoule Solution Silver Nitrate, 1 per cent
- Typhoid Paratyphoid Prophylactic hospital size package
- Polyanaërobic Antitoxin

DE PREE CHEMICAL CO.
- Sulpharsphenamine-De Pree, 0.5 Gm. Ampules
- Sulpharsphenamine-De Pree, 0.9 Gm. Ampules

H. K. MULFORD CO.
- Gelatin Compound Phenolized-Mulford
- Diphtheria Toxoid-Mulford, 30 c.c. vial
- Erysipelas Streptococcus Antitoxin, Concentrated, 10 c.c. syringe
- Typho-Bacterin Mixed (Triple Vaccine TAB), thirty 1 c.c. vial package
- Typho-Serobacterin-Mulford (Sensitized Typhoid Vaccine), 3 syringe package
- Normal Horse Serum without Preservative

NATIONAL DRUG CO.
- Diphtheria Toxoid

THOMPSON'S MALTED MILK CO., INC.
- Thompson's Maltose and Dextrin

TRUTH ABOUT MEDICINES

Digitos Ampules, 5 c.c.—Each ampule contains digitos (New and Non-official Remedies, 1929, p. 138), 5 c.c. H. K. Mulford Co., Philadelphia.

Luminal Capsules, 1 1/2 grains.—Each capsule contains luminal (New and Non-official Remedies, 1929, p. 81), 1½ grains. Winthrop Chemical Co., Inc., New York.

Metaphen 2,500.—It contains 1 part metaphen (New and Non-official Remedies, 1929, p. 272) dissolved in 2,500 parts of water containing 0.33 per cent each of sodium bicarbonate and sodium carbonate. Abbott Laboratories, North Chicago.

Diphtheria Toxoid-Squibb.—This diphtheria toxoid (New and Non-official Remedies, 1929, p. 368) prepared from diphtheria toxin whose L+ dose is 0.2 c.c. or less by treatment with 0.3 to 0.4 per cent formaldehyde. It is tested for antigenic potency by injection into guinea pigs. It is marketed in packages of one immunization treatment of three 1 c.c. vials; in packages of ten immunization treatments of thirty 1 c.c. vials; also in packages of one 30 c.c. ampule. Cutter Laboratory, Berkeley, Calif. (Jour. A. M. A., November 16, 1929, p. 1559.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Report of the Public Relations Committee of the St. Louis County Medical Society

The Public Relations Committee is completing its second year. During this short period it has developed into a committee with more demands on it for service than any other in the society. This has been brought about in spite of the fact that no aggressive attitude has been taken, but rather the committee has stood ready to render service whenever called upon. This proves conclusively that up to two years ago we were passing a golden opportunity to sell a modern scientific medium to the public. No one will argue the fact that information given to the public, through talks and other methods, promotes better health and more happiness. With less preventable diseases, there will be more efficiency and greater production with the general benefit to the whole community. Looking at it from a selfish point of view, it gives us an opportunity to create a greater demand for medical services. Scientific Medicine has much to offer and nothing to hide. Having goods of merit, the better the public is acquainted with, the greater will be the demand for them. We have so many lines that have hardly been touched. The foremost, perhaps, being periodical health examinations.

About one hundred talks have been given to groups and organizations during the past year. Nearly sixty were given during health week last winter. Material was furnished for the "Annual Baby Section" of one of our daily papers, which provoked a very complimentary editorial for us. Speakers have been provided for the "Sixth Industrial Safety School" which was conducted by the Chamber of Commerce last month. The audience consisted of seven to eight hundred foremen and superintendents from Duluth and surrounding towns, who in turn take the message home to the men working under them, so, ultimately, we will reach many thousands.

Work with the newspapers has been rather discouraging. Material presented to them is so badly revamped, it is almost impossible to recognize it in print. Their attitude is changing and they are now calling for material more often, so it is hoped that before long they will be less suspicious that we are looking for free advertising and will be more willing to coöperate.

F. H. Magney, M.D., *Chairman.*

WHAT YOUR STATE MEDICAL ASSOCIATION DOES FOR YOU

1. Publishes the scientific journal, Minnesota Medicine.
2. Creates a Fraternal feeling among physicians and enables them to coöperate with each other in local and state matters.
3. Studies constantly the many changes that are taking place in scientific and economic medicine through the many activities of the committees.
4. Notifies members of current events that affect the profession through Minnesota Medicine, and also sends special communications of unusual, legal, and legislative occurrences.
5. Conducts graduate courses covering the newer aspects of medical practice.
6. Proposes state legislation in the interests of scientific medicine and the public health. It has also been instrumental in defeating many measures which have been proposed to the detriment of scientific medicine and public health.
7. Assists local societies in presenting programs of interest and in securing speakers.
8. Enables its members to secure malpractice insurance at a reduced rate.
9. Conducts an Annual Meeting to which the best medical men in the state and county bring the results of their latest experience and research.
10. Furnishes the members prompt and confidential information on any subject relating to the practice of medicine through the Consultation Bureau.
11. Sends our Legislators *Hygeia* and *Everybody's Health* in order that they may be properly informed on matters of health.
12. Maintains a Speakers Lay Library containing material on subjects suitable to laymen and loans the material to the doctors upon request.
13. Sends weekly health stories to two hundred and sixty rural newspapers.

The welfare of the profession depends upon the support you give it. A well organized profession means greater respect and better compensation.

OF GENERAL INTEREST

Dr. Tom A. Williams, late of Washington, D. C., has returned to Florida from a year in Europe and is now located at the Monterey Apartments, 1611 Michigan Avenue, Miami, Florida.

Leland A. Watson, son of Dr. and Mrs. J. A. Watson of Minneapolis, has been selected as one of thirty-two students in the country to receive the Rhodes scholarship this year. The men elected will take up their studies in Oxford, England, in October, 1930.

Dr. Charles Bolsta of Ortonville, Minnesota, was appointed in December by Governor Christianson to succeed Dr. S. H. Boyer of Duluth as a member of the state board of examiners in the basic sciences. Dr. Bolsta's term of office is for six years, ending April 1, 1935.

The new Community hospital at Detroit Lakes, Minnesota, was opened in December. The new building is a two story structure with full basement and is equipped with 21 beds, placed in 17 rooms. The nurses' quarters are in the basement and consist of a suite of three rooms.

The marriage of Miss Margaret Ritchie of Little Falls and Dr. Asher Abbott White, son of Dr. and Mrs. S. Marx White, of Minneapolis, was solemnized at the First Congregational church in Little Falls, Saturday, December 14. They will make their home in New York, where Dr. White is completing his internship.

The following five University of Minnesota students have been recommended to the medical offices of the United States Army in Washington for internships of one year beginning in July at one of the five Federal Army hospitals in the United States: Norman Anderson, Frank Bacon and Verne Carlson, Minneapolis; Kenneth Ernst, St. Cloud; Theodore Fritsche, New Ulm. Carl Horn of Minneapolis and Robert Hargreaves of Saint Paul were named alternates.

Dr. W. A. Jones announces the termination of his association with Doctor Kittelson. Beginning January 1, 1930, Dr. N. J. Berkwitz will be associated with Doctor Jones. Doctor Berkwitz has been in the department of nervous and mental diseases since 1925 as a teaching fellow and as an assistant and he also was a resident physician at the Boston Psychopathic Hospital for six months. He has recently received a Doctor of Philosophy degree in Nervous and Mental Diseases.

The Eustis Addition to the University Hospital is now open and beds are available for the care of crippled and deformed children who are under 15 years of age. Cases over this age and adults can be taken care of in the General Hospital, where the Orthopedic Division is also functioning. Application for admission to the Orthopedic beds must be made in the same way as for admission to the other services and blanks can be obtained upon request from the hospital.

The Eustis fund provides for not more than 20 free beds, and doctors interested in these should correspond directly with the Superintendent of the hospital. Children who are mentally below the average will not be admitted.

SHORT COURSES IN TUBERCULOSIS SUCCESSFUL

With approximately 140 physicians in attendance and many other applications not accepted because of limitation in size of the classes, the seven short courses in tuberculosis held in Minnesota this fall under the auspices of the Minnesota State Medical Society, the Minnesota Public Health Association, and the various sanatoria were a success, according to the authorities of the various coöperatng organizations.

In addition to lectures by various authorities on tuberculosis, practical demonstrations of tuberculin testing were given. Sanatorium children were given the test previous to the day of the meeting, and examined by the visiting physician for their reactions. *X*-ray pictures were also studied. Medical examinations of patients were made by the enrolled physicians and were checked with the *x*-ray pictures.

Subjects which were discussed included Surgical Complications, Collapse Therapy, Tuberculosis in Children, *X*-ray, Sanatorium Management, History, Gastro-Intestinal Tuberculosis, Sanatorium Care of Tuberculosis in the State, Diagnosis, and Sanatorium Cases.

Among the physicians of the state who spoke at the various short course sessions were Dr. H. L. Taylor, Dr. F. F. Callahan, Dr. E. K. Geer, all of Pokegama Sanatorium; Dr. W. S. Broker, Ottertail County Sanatorium; Dr. Fred Kumm, Fair Oaks Lodge Sanatorium; Dr. L. H. Flancher, Sand Beach Sanatorium; Dr. W. G. Paradis, Sunnyrest Sanatorium; Dr. L. S. Jordan, Riverside Sanatorium; Dr. S. A. Slater, Southwestern Sanatorium; Dr. E. S. Mariette, Dr. F. L. Jennings, and others from Glen Lake Sanatorium; Dr. J. A. Myers, Dr. W. A. O'Brien, Dr. L. G. Rigler, Dr. W. H. Ude, and Dr. C. B. Wright, all of the teaching staff of the University of Minnesota; Dr. Arnold S. Anderson, executive secretary, State Board of Control, Tuberculosis Division; and Dr. George Earl, Chairman, Public Health Education Committee, State Medical Association.

In connection with the majority of the short courses, public meetings were held in the evening and were well attended. A number of the short course staff gave popular health talks at these meetings and also spoke at high school and college assemblies in the towns visited.

Christmas Seal Funds helped finance these courses.

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a young man, seventeen years old, who had a Wassermann test made a year ago. He received two injections of neosalvarsan at that time. He did not have any other treatment and gradually grew worse. His mind is now affected; he is not able to walk; he is in bed most of the time.
I am giving him neosalvarsan every five to six days. Will you kindly advise me as soon as possible what the latest treatment for syphilis is? Is there any other drug being used besides salvarsan?

   Answer.—I assume from your letter that the original Wassermann test and treatment was done elsewhere. I would advise you to repeat the blood Wassermann and to do a spinal fluid examination. It would also be a good idea to check your neurological findings again. If you are satisfied that he has syphilis with involvement of the central nervous system, the following treatment is suggested:
(1) Tryparsamid once a week for twelve weeks. This is given like neosalvarsan. Start with the one gram dose and increase to three grams.
(2) Follow with six to eight treatments of .6 neosalvarsan every five days.
(3) Then follow with bismuth salicylate in oil every four days or twice a week for twelve weeks. Give one to two c.c. in the hip.
After doing this, we would be very glad to hear from you again and advise you as to the best type of treatment to follow.

2. *Question.*—I would like to find out about the use of typhoid vaccine intravenously in the treatment of arthritis:
(1) What dose should be used?
(2) How many times should this dose be repeated?
(3) For what types of arthritis is this treatment best used?
(4) What advantage has this over the intramuscular injection of boiled milk or other proteins?
(5) What is the theory of its mode of action?
I have a patient, age 29, male, who, I think, would be benefited by this treatment. He has had pain in the left hip, radiating down the leg into the calf of the leg, and sometimes into the instep, since January of this year. It was quite severe until the warm summer months, when, he states, "He could just notice it." This fall, beginning with the cold, the pain has recurred, at times causing loss of sleep and compelling him to do very little, if any, work. He does not have a fever, has not had any redness or swelling of his joints, and the pain is limited to left hip and leg. An *x*-ray of the pelvis was negative. Two suspicious teeth were extracted, and his tonsils were removed with very little, if any, improvement. Please advise me as to the possibility of benefit in this case from the use of typhoid vaccine. This patient has not been benefited by use of salicylates by mouth or intravenously.

   Answer.—Before any further treatment is given, it is best to consider the diagnostic possibilities, and sciatic neuritis should be given consideration. The history of your patient suggests that the nerve may be involved. Is the pain worse on stretching the leg? Is there any atrophy of the calf muscles? Is the Achilles' jerk absent on the affected side? I note that you have had *x*-rays of the pelvis. In a young man with persistent pain such as you have described, osteogenic sarcoma should be considered. We have seen several examples of a long history of pain before the appearance of bone or *x*-ray findings. If you can rule out tumor, and are sure that the joints are not involved, we would suggest using injections of salt solution in the nerve with absolute bed rest and applications of heat before trying protein therapy.

3. *Question.*—There are many lamps on the market at the present time, which are supposed to deliver ultraviolet radiation. How does one gauge the effectiveness of the various types offered to the public?

   Answer.—The best way to compare the various types of lamps is to find out the number of minutes necessary to secure an erythema dose. There is a lamp on the market at the present time, which gives a slight erythema in 45 minutes. This would place it in the harmless class and would be suitable for use in a children's playroom. There is another lamp sold for home use from which an erythema dose can be obtained in 10 to 12 minutes. There is still another in which the erythema dose can be secured in practically the same time as in a physician's office. Before purchasing a lamp it would be best to ascertain the effectiveness of the same by measuring it in the foregoing terms.

4. *Question.*—Would you please send me the treatment for epidemic encephalitis, which is considered the best. If it is the use of neutral acriflavine, please give me the name of the company from which we can get it in the form of ampoules.

   Answer.—We assume that you refer to the chronic stage of epidemic encephalitis. The treatment of the acute stage is the same as the treatment of any other acute disease. We have found that hyoscine hydrobromide in grains 1/100 doses two or three times daily for an adult of 150 pounds gives the best relief of the symptoms of rigidity and tremor. It is true that this is not uniformly successful, but it seems to offer us the best therapy that we have. Neutral acriflavine, in our experience, has not been so successful. We have tried it, however, and intravenous injections can be made. Ampoules of neutral acriflavine may be obtained from any supply house. In any event, it is very difficult to separate the psychic response from real therapeutic result.

OBITUARY

Charles L. Carman

1859-1929

Dr. C. L. Carman, for thirty years a practising physician of Saint Paul, died on the evening of December 13, 1929, at Saint Luke's Hospital, Saint Paul.

Born February 19, 1859, in Kingston, Ontario, Dr. Carman left his home as a young man to study music in New York. When he first came to Saint Paul he taught voice and was very active in musical circles.

A short time after coming to Saint Paul Dr. Carman decided to study medicine and graduated at the University Medical School in 1897. He has practised medicine in Saint Paul ever since, in recent years having specialized in nose and throat diseases.

Dr. Carman joined the Ramsey County Medical Society March 1, 1909, and has been an emeritus member in recent years.

Dr. Carman is survived by one son, Dr. Paul Carman of Saint Paul, and four sisters, Ella and Blanche Carman of Buffalo, New York, Mrs. George Agnew of Mission, Texas, and Mrs. Marcus Simpson, South Glastonbury, Connecticut.

Floyd E. Best

1887-1929

Dr. Floyd E. Best died at his home at Wells, Minnesota, Nov. 9, 1929.

Dr. Best was born Dec. 13, 1887, at Freeport, Ill. He graduated from the Freeport High School in 1906, taking his B.A. degree from the University of Illinois and his M.D. from Northwestern University in 1911. He received his Minnesota license in 1913. His internship of 18 months at St. Joseph's Hospital, Chicago. He also served in hospitals at Los Angeles, Calif., and the Catalina Islands before starting his practice at Wells, Minnesota. During the world war Dr. Best was a first lieutenant in the medical corps, being stationed at Washington, D.C., and later at Humphrey, Va., during the "flu" epidemic. He was graduated from the Army Medical School at Washington, Oct. 25, 1918. Following the war he resumed his practice at Wells, in partnership with Dr. P. F. Holm.

Dr. Best was a member of the Southern Minnesota Medical Association, the Blue Earth Valley, Minnesota State and American Medical Associations.

RESOLUTION OF CONDOLENCE

by the Physicians of the Blue Earth Valley Medical Society.

WHEREAS, the Supreme Ruler of the Universe in His Infinite Wisdom has seen fit to remove from our midst Dr. Floyd E. Best of Wells, Minnesota, an esteemed member of the Blue Earth Valley Medical Society,

THEREFORE BE IT RESOLVED, by the Physicians of this Society,

THAT we deeply regret the passing of a beloved fellow practitioner, because of the unselfish service rendered to his brother physicians and to his patients,

BE IT ALSO RESOLVED, That we offer to his family, their friends and the people of the vicinity of Wells, our most profound and heartfelt sympathy, and that copies of this resolution be sent to the family of the deceased member and to the Wells *Mirror,* and to Minnesota Medicine, Journal of the Minnesota State Medical Association, and be spread upon the minutes of the Blue Earth Valley Medical Society.

(Signed)
Wm. H. Barr, M.D.
P. F. Holm, M.D.
A. J. Henderson, M.D.
Committee.

Olaf Thorstein Sherping

1864-1929

Dr. Olaf Thorstein Sherping died suddenly at 4:15 a. m., December 7, at his home in Fergus Falls. The cause of death was angina pectoris.

Dr. Sherping was born Aug. 6, 1864, in Hallingdal, Norway. He was educated in the high school at Ness, and the University of Christiania. In 1884 he migrated to this country. Here he first worked on a farm, then studied medicine in a physician's office in Wisconsin, and later attended Valparaiso University, where he received the degree of Bachelor of Science. In 1893 he graduated from the Keokuk Medical College. Later he did post-graduate work in surgery in Chicago, New York, London and Vienna.

Dr. Sherping engaged in practice in Enderlin, N. D., from 1893 to 1902. He then moved to Fergus Falls, where he practised continuously until his death.

Dr. Sherping was the founder of St. Luke's Hospital of Fergus Falls, and served as Chief of Staff until 1928. He was a member of the American College of Surgeons, and a former member of the Minnesota State Board of Health.

In 1895 he married Miss May Sollin of Valley City, N. D., who, with his son Ralph, survives him.

His chief interest was in the field of surgery, and from the time when he first performed operations in the sod huts of Dakota until his death, he held a position of notable distinction in his profession.

UNDULANT FEVER

A specific treatment of undulant fever is not yet available. The use of serums has proved disappointing. Vaccines have given more encouraging results according to recent reports from the continent. In particular, an antigen prepared from dried *Brucella abortus* has seemed efficacious in a small number of cases. In this country the use of acriflavine hydrochloride has been suggested to shorten the duration of the disease. (Jour. A. M. A., November 9, 1929, p. 1475.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of November 13, 1929

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 13, 1929. Dinner was served at 7 p. m., and the meeting was called to order at 8 p. m. by the President, Dr. C. N. McCloud.

There were 35 members and 1 visitor present.

Minutes of the October meeting were read and approved.

A committee consisting of Drs. J. W. Bell, Geo. D. Head, and S. Marx White was appointed to draw up resolutions on the death of Dr. Louis A. Nippert.

The scientific meeting consisted of the following:

Dr. H. A. H. Bouman (Minneapolis) read an historical study of "The Goiter Problem and Theodor Kocher."

DISCUSSION

Dr. Gustav Schwyzer (Minneapolis): We have listened to night to an essay which is the result of an extensive historical study concerning goiter surgery and its founder, Theodor Kocher. Nowadays when thyroid surgery is being done all over the world, it may be timely to bring out the life of the man who did most of the pioneer work in this line.

Dr. Bouman's paper is indeed laudable and commendable. He refers to many of the circumstances of historic interest that surrounded the men who began goiter surgery, and mentions the obstacles these pioneers had to overcome. He calls to our attention Billroth, who was Professor of Surgery in Zurich about 1860-67. I well remember one of his papers on goiter surgery that I read years ago. He reported a small number of goiter cases and of these most of them died from tetany. This mortality rate exceeded Kocher's. The latters success might have been due to his careful way, his method in handling the recurrent nerve and leaving what we call today the safety zone—all such procedures at a time when parathyroids were unknown.

Dr. Bouman's essay does not, in my estimation, call for discussion; however, if you will allow me I will add a few words about Theodor Kocher, with whom I was intimately connected in the nineties. He was a brilliant teacher. His clinics were world-famous. Any one who ever had the privilege of attending one of his clinics could not help being impressed by the magnitude of his knowledge and the accuracy of his diagnosis.

Kocher was not only a brilliant teacher, he was also a great leader as surgeon and writer. Over 200 papers were published in different journals during his activity. He collected the important facts from his material and compiled them into book form for permanent reference. His book on fractures is even today a very commendable work. Another book, which has never been translated into English, on lesions of the spine due to injury or fracture was not only of great surgical interest but an addition to physiology of the spine as well. His work on staphylomycosis and streptomycosis is unique. His book on operative surgery truly expresses the vast wisdom he amassed in his lifetime. There is no phase of surgery wherein Kocher did not do original work.

Always trying to get nearer and nearer the truth, he never missed an opportunity to attend a postmortem examination during his forty-five years of activity at his clinic in Berne.

His endurance for work was simply marvelous, and remained so until his last days. Just two days before he died, in his 74th year, he successfully performed an extensive abdominal operation.

I think we all feel grateful to Dr. Bouman for his interesting review on goiter surgery that he has given us tonight.

Dr. J. T. Christison (St. Paul) reported a case of subacute aleukemic lymphatic leukemia in a young boy, and showed lantern slides.

The patient, a small Canadian boy of 6 years, was admitted to the Charles T. Miller Hospital on September 8, 1929, complaining of a fluctuating temperature, anemia and listlessness.

The child was perfectly well until March, 1928, when he suddenly became ill with a sore throat and high fever. He was confined to his bed for about 5 weeks. His temperature became normal after three weeks' time, when desquamation of the hands and feet was noticed. He had no urinary symptoms, and the father does not recall the child having a cough, nor did he notice a rash. Following this illness the child was pale and listless, but the father was not aware of any elevation of temperature.

Some time early in August, 1929, the mother noticed a marked change in the child. On awakening in the morning he would complain of being very tired and preferred to remain in bed. There was a slight elevation of the temperature at this time and there were noticed black and blue spots over the body, varying in size up to that of a silver half dollar, and apparently spontaneous.

The patient was not a bleeder, although he had had one nosebleed in the latter part of August, which was very mild and lasted only a few minutes.

At the onset of this illness in August the child complained of his legs hurting and seemed to have a painful right knee, at times walking a little stiff.

On September 6, 1929, the child was taken to a hospital in Canada, where the father was told that the child had a very bad heart. He was kept in the hospital one day, receiving no treatment nor medication except aspirin (5 grains every hour for 12 hours). While there his temperature varied from 101.4 to 106 degrees and his pulse from 130 to 148.

The child was then brought to St. Paul and admitted to the Miller Hospital.

Investigation brought out the fact that the child had had no other illnesses except those already mentioned.

He had a tonsillectomy about five years ago, was a breast-fed baby, having been delivered normally.

The child's father and mother, 38 and 36 years of age, respectively, are apparently well, although it was learned that the mother gets very pale at times and has dyspnea on exertion. The father, at the time this history was taken, also looked very pale. One sister, ten years, and one brother, four months, are well, although there is a history of eczema and asthma in these two children. One brother died at thirteen months, of influenza. There is no history of eczema or asthma in the parents or grandparents; nor is there a history of tuberculosis, and it is not known that there were any bleeders in the family.

The father stated that the child passed very large amounts of urine rather reluctantly, complaining of pain. Previous to hospital entry no blood had been noted in the urine.

The child had not been constipated nor had he had diarrhea, and no blood had been noted in the stools.

There had been no swelling of the hands or feet.

A blood transfusion was done on the day after admission to the hospital (Sept. 9) and 500 c.c. of blood given. The patient was classed in Group IV, as was his donor, and the two bloods matched without agglutination. Before the transfusion his blood was: Hb. 23%; red cells 1,550,000; leukocytes 5,350; granulocytes 3%; lymphocytes 97%; and platelets 52,500. After the transfusion his blood was: Hb. 48%; red cells 3,340,000; leukocytes 4,300; granulocytes 4%; lymphocytes 91%.

On September 18 a blood pressure cuff was applied to the left arm and the mercury kept between 95 and 102 mm. The forearm was covered with a light cradle and in six minutes the arm suddenly became covered with small petechial hemorrhages.

On this date he was again transfused, receiving 500 c.c. of blood, the donor this time also being in Group IV and the two bloods matching without agglutination. Before transfusion his blood was: Hb. 48%, red cells 3,340,000; leukocytes 7,750; granulocytes 4%; lymphocytes 93%; and platelets 32,500. After transfusion it was: Hb. 60%; red cells 3,800,000; leukocytes 4,350; granulocytes 4%; lymphocytes 92%; and platelets 97,500.

A consultation by Dr. Connor, of the Nose and Throat Department, disclosed an existing condition of herpes labialis and pale mucous membranes; also a suggestion of thickening of the buccal surface of the gingiva and buccal pads, a scar of a healed ulcer between the upper right first and second bicuspids, and although the tonsils were out there was one small follicle at the base of each fossa. The nose was negative except for pallor and slight septal erosion on each side. There was no sinus infection.

Two weeks later the findings were the same except for the presence of enlarged hemorrhagic follicles in the pharyngeal wall.

On October 4, three teeth were extracted under nitrous oxid anesthesia.

On October 10 the patient was again transfused. He received another 500 c.c. of blood, his donor being classed in Group IV and the two bloods matching without agglutination. This time his blood before transfusion was: Hb. 50%; red cells 2,810,000; leukocytes 6,350; granulocytes 4%; lymphocytes 96%; and platelets 28,000. After the transfusion it was: Hb. 68%; red cells 3,750,000; leukocytes 8,050; granulocytes 5%; lymphocytes 95%; platelets 24,000.

Examination on October 22 showed a petechial rash over the lower extremities and mucous membrane of the mouth. A general reticulo-endothelial proliferation was seen. All glands were moderately enlarged and somewhat hard. At the costal margin the spleen was felt to be somewhat enlarged, though not of lymphatic leukemic type. The liver was also felt at the costal margin.

On October 24, under nitrous oxid anesthesia, several small lymph nodes were removed from the right axillary region. The largest of these was about 5 millimeters in diameter. Microscopic examination showed the prominent feature of the sections to be the diffuse infiltration of large lymphoid cells throughout the nodes, which obliterated the sinuses. The capillary endothelial cells were swollen and prominent everywhere. Diffuse hemorrhage was noted in some areas. The reticulum fibers and reticulum cells were prominent in some parts. The capsules were apparently unbroken. One showed a thickening, edema and hemorrhage and invasion of lymphoid cells into it. A diagnosis of leukemic infiltration of the lymph nodes was made.

At this time the child complained of slight pain in his right knee, especially when the leg was fully extended. There was no apparent swelling, redness or papable tenderness, and measurements of the knees were found to be exact.

Subsequent examination at this time showed the lower edge of the spleen palpable at the left lower costal margin although abdominal distension was so marked as to make palpation unsatisfactory.

During the patient's hospitalization his temperature varied from 98 to 105.4 degrees, and his pulse from 80 to 160.

All urine examinations were negative.

On September 13 his bleeding time was 3 minutes and 20 seconds, and his clotting time 5 minutes and 25 seconds. On October 23 his bleeding time was 5 minutes, and his clotting time 6 minutes and 10 seconds.

Hemoglobin ranged from less than 20% to 70%.

Leukocytes ranged from 1,200 to 12,800.

Red blood cells ranged from 890,000 to 3,990,000.

Reticulocytes from .04% to .3%.

In Schilling Differentials, granulocytes varied from 0 to 6% and the lymphocytes from 90% to 100%.

Platelets varied from 97,500 to 10,000.

Widal was negative.

Blood culture was negative after four, seven, ten, twenty-one and thirty days' incubation.

Blood smear showed 97% lymphocytes. Lymphocytes were of usual mature types with normal variations in size. One per cent were immature or lymphoblast type, a common finding in cases with a marked lymphocytosis. The changes in the red cells are slight for the

grade of anemia. Slight anisocytosis and slight poikilocytosis was present.

Blood smear was submitted to Dr. Downey of the University of Minnesota for his opinion. He agreed with the hospital pathologist in a probable diagnosis of leukemia, subacute stage.

Morphological study (9/30) strongly suggested subacute aleukemic lymphatic leukemia. The pathologist advised consideration of prolonged chronic infection, also.

Morphological study of smears (10/3) showed appearance of the lymphocytes to indicate many of them were pathologic. Nuclei showed a fine, delicate, more or less homogeneous chromatin network and little condensation. In a few, one or more nucleoli were noted and occasionally they were lobulated (questionable Reider type). A narrow zone of dark dirty blue cytoplasm was noted. Apparent absence of cytoplasm in some was not due to staining reaction. A few more mature large lymphocytes showed a wide zone of bluish hyaline cytoplasm in which a few azure granules were seen. Gumprechet shadows were not seen. The red cells showed little polychromasia, if any, and no basophilic granular degeneration. Platelets were very scanty. Granulocytes were less than 10 per cent of cells. Myelocytes, metamyelocytes and older metamyelocytes (band form) were recognized as much as the fully mature neutrophiles, but they were very scarce. Basket cells were seen occasionally. Of course there were many fully mature lymphocytes and occasional plasma cells.

Microscopic examination of the feces showed no red blood cells, leukocytes, parasites or ova. All the usual qualitative tests for urobilin were positive.

Culture of the teeth showed a predominating growth of nonhemolytic streptococci and of staphylococci.

The patient failed rapidly the last week of his life and on the morning of October 29 he had two convulsions, and died of general exhaustion.

DISCUSSION

Dr. Christison: We had an opportunity to observe this entire family. The mother was pale and decidedly anemic in appearance. She was advised to stop nursing the baby. We had blood counts made on the baby, who was left in the hospital for some time, and also on the daughter. I asked Dr. Richards to investigate the mother's condition and he will tell you something about that.

The whole picture from the beginning to end was a hopeless one, as most of these cases of leukemia usually are. An autopsy was done on this boy but we have not yet had time to complete all the studies. I think there will be at least something to add to the pathology of alymphatic leukemia.

Mr. President, I would ask that you call on Dr. Ikeda, who did the postmortem on this case.

Dr. Kano Ikeda (St. Paul) (by invitation): The pathological picture about to be described is not anything unusual, but a typical picture of an acute case of lymphatic leukemia. It is not necessary for me to describe in detail the specimens. I have brought them for you to see. The one striking thing in the external appearance is the waxy pallor of the skin without any emaciation. There were many small petechial spots over the body.

On opening the thoracic cavity nothing unusual was found. The thymus was about 20 gms. in weight, an increase which is usual in this condition. The liver weighed about 1,000 gms., a few hundred grams larger than normal in a child of this age. It was pale orange yellow in color as shown here, and this color is practically the same as when it was autopsied. The spleen weighed 125 gms., or perhaps twice the normal weight. The capsule was dark red and tense, and the cut surface showed a very firm, red pulp. The corpuscles were indistinct. In the gastrointestinal tract, the stomach was very striking in appearance in that there were very many hemorrhagic spots over the mucous membrane. There was hyperplasia of the Peyer's patches in the terminal ileum. The kidneys weighed about 150 gms. (right) and 160 gms. (left) and showed a swollen, waxy parenchyma with areas of hemorrhages in the cortex, as seen in the specimen. There were also some petechial spots in the mucous membrane of the bladder. In a kidney of this kind you would think the function would be impaired. The urea nitrogen of the pericardial fluid showed about 20 mgms. per 100 c.c., which means that probably the function of these kidneys was not particularly impaired. No red cells were seen in the sediments of the urine obtained at autopsy. The lymph nodes, while not very large, were practically every one reddish in appearance with some hemorrhage, so that they are distinctly visualized all along the intestinal border of the mesentery and in the retroperitoneal groups. The bone marrow was hemorrhagic and showed rather solid marrow tissue. The smear made on this, and stained with Wright's stain, shows it to be practically entirely predominated by lymphoid cells. The striking picture found in these specimens is due to a terminal gush of hemorrhage which produced these hemorrhagic spots all over. (Several lantern slides of microscopic sections were shown.)

One thing I want to emphasize is the importance of a careful study of blood smears in cases of this kind, particularly when they happen to be children. This shows us a lesson. When a condition such as this occurs in practice, the ordinary blood counts alone would not be sufficient.

Dr. E. T. F. Richards (St. Paul): The case of the mother is interesting in connection with this child's illness. She gives a history of having been pale and anemic over a period of 12 years, although we could obtain no figures on the degree of anemia. Her age is now 37. She was said to have been particularly anemic at the time this child was born. She has never bled and there have been no other symptoms whatever except the weakness attendant on the anemia. She now shows marked pallor and a very large spleen. There is no generalized adenopathy. Her red cell count is below 3,000,000, Hb. below 40 per cent, with a leukopenia of 4,000, but nothing abnormal in the differential. She has a normal amount of free hydrochloric acid in the gastric contents.

As we do not know the cause of leukemia, one wonders if a particular type of bone marrow insufficiency may have been transmitted by the mother to the child. Then there is, in addition, the infant sister with a profound anemia.

It is a very remarkable coincidence at least, and there may be quite possibly some connection which our studies on leukemia so far have not made clear.

Dr. Walter Ramsey (St. Paul): It is interesting that in these children with leukemia one not infrequently finds a low leukocyte count, which often amounts to leukopenia. One can slip up on them if one is just looking for a leukocytosis. Dr. Stewart had a case of leukemia in the Children's Hospital which never had over 10,000. A high leukocyte count is not necessary in children.

Dr. H. L. Ulrich (Minneapolis) reported a thyroid case complicated with acute rheumatic fever. X-ray films were shown, and postmortem report given.

The meeting adjourned.

Carl B. Drake, M.D.
Secretary.

TRANSACTIONS OF MINNEAPOLIS SURGICAL SOCIETY

Regular Monthly Meeting, Oct. 3, 1929

The meeting was called to order at 8 p. m. in the Hennepin County Medical Society lounge, with an attendance of twenty members and four guests.

The meeting was given over to a discussion of case reports and the presentation of papers.

Dr. Arthur F. Bratrud presented a case of extensive burns on a child twenty months old treated by the immediate application of 10 per cent tannic acid solution. The results in this case were unusually good. No infection had set in and the crust was dry and brown. The child was comfortable within half an hour after the application of the solution as wet packs and has had no pain at any time since.

Dr. Martin Nordland gave the following very interesting discussion of chorio-epithelioma, and showed microscopic slides of his two cases. His paper received a very general discussion by members present.

Chorio-epithelioma is a very malignant tumor, arising invariably in connection, either immediate or remote, with pregnancy. The subject is one of the most debatable chapters in pathology because of the great variation and the frequent lack of coördination between the clinical and pathological findings. In 1910, Ewing made a classification, according to the histology, dividing the tumors into the two main divisions: (1) Benign chorio-adenoma and (2) malignant chorio-carcinoma.

Geist, a later author, believes that there are so many transitional forms between Ewing's chorio-adenoma and chorio-carcinoma that it is impossible to differentiate accurately enough by histological means to be of any prognostic value. Geist's conception seems to be that of the majority of pathologists at the present time.

According to Dr. Bell, the microscopic picture must show invasion of the uterine wall by nests of Langhans cells surrounded by syncytial cells.

In summary, the disease is of fetal origin, therefore in fertile women and located usually in the uterus with a period of latency of a few weeks to several years. Metastasis occurs in nearly all cases through the blood stream, explained by a tendency of the fetal ectodermal cells to erode and penetrate the blood-vessels. The lungs are the most frequently attacked. The vagina and vulva are next in frequently, due to the venous network present. Symptoms are dependent upon whether a uterine tumor or metastasis exists. The most characteristic and prominent symptom of uterine tumor is hemorrhage. Intra-peritoneal hemorrhage (due to a perforated uterus) simulating ruptured tubal pregnancy, is rare. My second case, reported here, deals with such an onset.

There is no uniform treatment. Hysterectomy seems the most reasonable single form of treatment. Radium has not been used enough to warrant conclusions. Partial removal and curettements have cured the disease in some cases and were advocated by Ewing in young women. Prognosis as a whole is bad, recurrence within a year being the rule. There are cases recorded undergoing spontaneous cure.

The first case that I shall report will illustrate Ewing's chorio-adenoma and occurred in a woman thirty-five years of age, whose history is as follows:

Past and family history is essentially negative.

Menstruation began at fourteen years of age and was normal up to seven months before examination. Five normal pregnancies went to term. Miscarriage occurred in January, 1926, following scarlet fever.

The chief complaint had been irregularly recurring menstruation, lasting for periods of six weeks for the past seven months. She had never been quite free from bleeding during that time. She had severe backaches most of the time, felt tired and worn out. Three weeks before examination, the patient noticed a watery discharge with a peculiar pale, pink-colored secretion without odor, for a few days at a time, when the hemorrhage seemed to subside. Patient seemed quite nervous, had a good appetite and slept well. She had not lost in weight.

Physical examination revealed an extremely pale individual, with a dry tongue. Temperature was normal and blood pressure 116/94. Except for a systolic mitral murmur, general examination was entirely negative. Bimanual examination revealed a uniform, smooth painless mass, the size of a large orange, apparently a part of the fundus, filling the cul-de-sac and tilted to the left. It had a cystic feel. The mass was not fixed, could be moved in any direction, returned to the left adnexal region. There was a bloody vaginal discharge. Two weeks later, on re-examination, the physical findings were identical with the previous examination. Patient had a steady bleeding since the first examination. There was no evidence of pain

with the bleeding, such as might be expected with pregnancy.

A diagnosis of uterine myoma was made and hysterectomy recommended.

At operation, the uterus was found to be the size of a grapefruit, corresponding to the preoperative findings, with a dense attachment of the omentum to the left horn. A subtotal supra-vaginal hysterectomy was made.

The specimen proved to be a chorio-epithelioma, grossly and microscopically, the diagnosis being confirmed by Dr. E. T. Bell.

The second case is that illustrating Ewing's chorio-carcinoma with an acute intraperitoneal hemorrhage from uterine rupture. The history is as follows:

A woman, twenty-five years of age, had a history essentially negative except for one pregnancy which went on to term August 3, 1926.

Chief complaint: Last normal period was May 15, 1928. She began to flow July 7, 1928, continued to flow moderately and severely by spells. She was curetted on July 25, 1928, leaving the hospital on July 27. She began to flow again on August 6, with a hemorrhage on the 8th. The patient continued to flow, became anemic, cachectic and extremely weak and on the 6th of September was again curetted. Following this procedure, the patient became much better, apparently regaining her former health, but the regularity of her menstruation was slightly interfered with. An occasional spotting was present. On April 28, nearly one year after the last normal period, the patient was suddenly seized with severe abdominal pain, beginning in the epigastrium and focusing in the right lower abdominal quadrant after about four hours. She had nausea and vomiting. The last regular period was two weeks before this attack of pain. About five hours after the onset, the abdomen was found rigid, with localized tenderness over McBurney's point. A tentative diagnosis of acute appendicitis or ectopic pregnancy was made. The patient was sent to the hospital, where the leukocyte count was 10,000, and a recount two hours later was 10,400. A third count was 9,600.

Bi-manual examination revealed a normal sized uterus in good position. There was some tenderness on examination and pain in the right adnexal region, but no mass was made out.

On opening the peritoneum, free blood was found, filling the interstices between the omentum and loops of the intestine. A snag of omentum was fastened to the top of the fundus of the uterus. The bladder was adherent to the rim of the fundus by recent adhesions and through the bladder fold could be seen an irregular mass, the size of a walnut, projecting on the anterior wall of the uterus. After the bladder was separated away bluntly with the finger, a spurting of bright red blood occurred. This mass was dark brown in color, and about the size of a walnut, projecting under the serosa of the anterior wall of the fundus. The serosa was broken in two places. On the posterior wall of the bladder was an ulcerated surface the size of a dime, with a necrotic base, from which blood was freely oozing. This corresponded to the attachment of the bladder over the mass.

A pan-hysterectomy was performed and the injured bladder repaired. The patient made an uncomplicated recovery.

A diagnosis of chorio-epithelioma was made at operation and confirmed by Dr. Smith and Dr. Bell.

According to Lynch, of the University of California, only nine cases with acute intraperitoneal hemorrhage have been reported.

Dr. Richard R. Cranmer presented the following report of an unusual case of ovarian pregnancy.

The patient is a married woman, aged 32, the mother of two children. No pregnancy has occurred since the birth of her second child five years ago. Menstruation began at the age of thirteen, lasted eight to ten days at twenty-eight day periods. There was no history of dysmenorrhea or pelvic infection.

She menstruated in February, 10 days, as usual, at which time she experienced severe cramp-like pains, especially on the left side. Previous to the menstruation she had had some pain of mild degree on the same side. One week after menstruation she experienced an increasing amount of pain, especially on lifting. She was seen at the office at this time and a mass the size of a lemon was felt to the left of the uterus. This mass was movable, but it gave her considerable pain on manipulation. The temperature was 100 degrees F. by mouth. The leukocyte count was 13,000, red cells 3,800,000, hemoglobin 80 per cent. A diagnosis of ovarian cyst was made and the impression was that it was probably twisted on its pedicle and possibly gangrenous, causing pain and peritoneal irritation, increased white cell count and fever. The possibility of ectopic pregnancy was considered because there seemed to be a slight uterine enlargement but was ruled out because the mass was freely movable and there was no history of a skipped menstruation. No nausea or breast signs had been noted. She was operated upon the following day. The mass was found to be the left ovary without adhesions to any structure. It was dark in color and about four or five times the normal size of an ovary. It was somewhat soft and was taken to be a hematoma of the ovary. It was removed and on opening it was found to contain a sac with clear fluid and what appeared to be placental tissue. A small grayish body was seen on a pedicle, which, I believe, was the fetus, but on looking for it later I could not find it. Dr. Graves sectioned and stained a piece of the tissue suspected of being placental tissue and reported it was placenta. A photomicrographic slide has been made which shows chorionic villi with their two layers, the syncytium and the layer of Langhans cells. The specimen itself was sent to Dr. George Strecter, Director of the Embryology Department of the Carnegie Institute. His report follows:

"I am enclosing photographs of your specimen which prove very conclusively that you have an ovarian pregnancy. In the photographs one can clearly recognize the corpus luteum, graafian follicles and typical ovarian

tissue, embedded in which is the ovum with normal appearing chorion and chorionic villi. The photograph of the gross slide laid open in the midline gives the appearance of the total chorionic sac occupying the central area of the ovary. Around the tips of the villi there is more or less extravasation typical of implantation areas."

Dr. Stanley R. Maxeiner showed two children, both aged six, operated upon for hypospadias by the Bucknall method. Both of these children, up to the time of their operations, had to sit down to urinate. In both instances, the urinary meatus is now at the frenum and both are able to void in the normal manner.

The meeting adjourned.

H. O. McPheeters, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

PATHOLOGY OF SO-CALLED "ACUTE PYELITIS" IN INFANTS: James R. Wilson, M.D., and Oscar M. Schloss, M.D., New York (Amer. Jour. of Dis. of Children, August, 1929, Volume 38, Number 2). Fever and the presence of moderate or large amounts of pus in the urine of infants or young children usually lead to the diagnosis of pyelitis. The authors believe that the usual cause of so-called pyelitis is a true suppurative lesion of the interstitial tissue of the kidney itself.

The frequency with which "so-called pyelitis" follows other infections in the body is suggestive. It seems possible that bacteria may be transported directly to the kidney and excite there an acute inflammatory lesion such as is known to occur in septicemia. This relationship, however, is suggestive only and cannot be considered direct unless the same variety of microorganism is demonstrated as the cause of both lesions.

Postmortem examination showed clearly in their group of cases that pyuria was due to suppurative nephritis, but the clinical picture was indistinguishable from that of so-called "acute pyelitis." Despite the results of postmortem examination, it may perhaps be assumed that pyelitis is the primary disease, with secondary involvement of the kidney. Case 3 is given in illustration.

Case 3.—Marked pyuria in a boy, aged 4 months. Multiple abscesses in one kidney removed at operation. Subsequent enlargement of remaining kidney. Recovery. Left kidney removed and showed an acute suppurative nephritis and a large number of small abscesses. The clinical history of this patient is fairly typical of so-called "acute pyelitis." The persistence of the pyuria and general symptoms following operation, with enlargement of the remaining kidney, strongly suggests that the lesions in both kidneys were identical.

This case demonstrates spontaneous recovery from severe suppurative nephritis and supports similar observations by Forbes, Chown, Bugbee, and others.

The authors believe that the smaller foci which were found in the milder cases of so-called pyelitis are not incidental, but in all probability represent the pathologic lesions which give rise to pyuria.

It is their belief, however, based on the evidence set forth, that the most common cause of severe pyuria in young infants, especially the type of case usually designated pyelitis, is an acute inflammatory process of the interstitial tissue of the kidney.

R. N. Andrews, M.D.

TUBERCULOSIS IN INFANTS UNDER ONE YEAR OF AGE—A STUDY OF THE AUTOPSY AND THE CLINICAL OBSERVATIONS ON INFANTS WITH TUBERCULOUS LESIONS: Katharine Merritt, M.D., New York, New York (Amer. Jour. of Dis. of Children, September, 1929, Volume 38, Number 3). Over a period of thirteen years at the Harriet Lane Home for Invalid Children, autopsies were performed on seventy-five infants under 1 year of age who showed tuberculous lesions.

Ribadeau-Dumas expressed the opinion that a mother with lesions which are becoming progressively worse during gestation can transmit bacilli to the fetus through the placenta.

The views of Calmette and his school, that placental transmission is common, do not seem to be founded on good evidence and are probably incorrect.

In forty-seven tuberculous children under 1 year of age, Hedren found that the bronchial lymph glands were involved in 100 per cent. The lungs were involved in every patient except two. Cavities occurred in nearly 50 per cent of the cases. They occurred most frequently on the right side.

Pleural adhesions were present in nearly 50 per cent of the cases, occurring most frequently on the right side. The spleen was involved in nearly all cases, the principal lesion found being miliary tubercles. The liver, also, was involved in nearly all the cases. The kidneys showed tubercles in more than half of the total number of cases. One-third of the total number of cases in this series showed a definite ulceration of the intestines.

R. N. Andrews, M.D.

ROENTGENOLOGY

SUPERVISORS

LEO G. RIGLER

MINNEAPOLIS GENERAL HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS

MAYO CLINIC, ROCHESTER

RADIOLOGY OF THORAX: Samuel Brown (Radiology, 1929, XIII, 575). The purpose of this paper is to show the value of studying the thorax in three dimensions. Theoretically, stereoscopy should answer every purpose but this is not the case. Samuel Brown believes after many years of study using stereoscopic plates and supplementing them with a lateral plate that the value of stereoscopy has been over-rated with the exception of an early tuberculosis. But in the case of gross lesions of the cardiovascular and pulmonary system, the anterior-posterior and lateral views are much superior in locating abnormal shadows, determining their relation to surrounding structures and the interpretation of their probable nature.

It has been observed that there exists a constant relation between the size of the thorax and the size of the heart. This has led to the following formula: The transverse and anterior-posterior diameters of the thorax are determined, the measurements being taken at the level of the fourth rib anteriorly. The two measurements are multiplied and the product is divided by the sum of the two measurements. The quotient will be equal to the transverse diameter of the heart under normal conditions. If the actual transverse diameter of the heart, on a six foot plate, does not exceed the predetermined measurement, it will be evident that no hypertrophy or dilatation exists. If, however, the actual transverse diameter of the heart is found to exceed the predetermined measurement, there is strong evidence of the existence of cardiac enlargement.

In the *x*-ray anatomy of the lateral view of the thorax, a glance at the anterior and posterior boundaries shows the anterior costophrenic angle to be on a higher level than the posterior costophrenic angle. Therefore, if a slight amount of fluid is present in the pleural cavity, it is the posterior costophrenic angle that will be obliterated first. The diaphragm may be found to be elevated and partly obscure the heart shadow due to paralysis of the phrenic nerve or increased intra-abdominal pressure. The diaphragm may be pressed low as a result of emphysema, pneumothorax or pleurisy with effusion. Adhesions between the diaphragm and pleura and their exact locations may be determined.

Fine changes in the lung apices cannot be differentiated, but gross changes and their exact location can fully be determined.

The hilus is recognized by its irregular dense shadow below the arch of the aorta. The esophagus cannot be differentiated unless it has been rendered opaque.

In the lateral view, the middle lobe of the right lung overlaps the heart shadow. Tuberculous cavities or infiltrations of a lobe can be located with certainty. The absolute location of a lesion is especially important in diseases of the pleura, such as interlobar empyema and encapsulated empyema.

Thus it is seen that anterior-posterior and lateral views enable one to study the thoracic structures in their true perspective, because one is studying volumes rather than surfaces.

E. F. JOHNSON, M.D.

WANTED—A PHYSICIAN TO DO LABORATORY work in payment for office rent in central district of Minneapolis; also will refer some work in general practice. Opportunity to assist in surgery will be given. Give references, age, school, and hospital of internship. Address D-51, care MINNESOTA MEDICINE.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

LOCUM TENENS WANTED—From January 15 to April 1, 1930. Recent graduate just finishing internship at Minneapolis General Hospital. Address D-52, care MINNESOTA MEDICINE.

WANTED—Position as assistant by laboratory technician, graduate of Minneapolis General Hospital; one year college; two years nurse's training. Address D-50, care MINNESOTA MEDICINE.

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MINNESOTA MEDICINE

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A REPORT OF FOUR CASES OF INOPERABLE CARCINOMA TREATED WITH INTRAMUSCULAR INJECTIONS OF KARKINOLYSIN*

ADOLPH M. HANSON, M.D.
Faribault, Minnesota

KARKINOLYSIN is an extract of the giant epithelial cells of the neck-thymus of young calves.

There is no need of my going into the results in any detail of work done on extirpation of the thymus or of thymus extracts that have been used. The consensus of opinion is that the thymus has something to do with the growth of bone; that it bears some relationship to the genital system in that it is supposed to atrophy after puberty and that castration causes a persistent growth of the thymus, and that its removal causes a hastening in the development of the testes; that it is concerned, especially, in the synthesis of nucleic acid. Achondroplasiac calves have exceptionally large thymic bodies with absence or mere vestiges of the thyroid. The extracts that have been used experimentally have been watery and alkaline extracts, containing the elements of the lymphoid structure and not the true thymus, and contain a large percentage of nucleohistone as similar extracts of lymph glands. This is thrown out of solution by acetic acid.

My supposition, or hypothesis (note that I do not even designate it as a theory), is that the giant epithelial cell of the thymus is the true thymus and that it subserves the function of controlling the correct, normal and healthy rate of epithelial mitosis and cell-division. Another hypothesis that I have considered is that the epithelial cells of the thymus, under certain abnormal or diseased conditions, may get into the lymphatic system and grow again in other locations. However, I have discarded this for the former, as carcinoma takes on the characteristics of the tissue or organ in which it originates: as adenocarcinoma in secretory glands and follicular structures as in the stomach, ovary, etc.

On this basis I decided that the true thymus effect could not be determined unless the lymphoid "muck" could be largely excluded and an extract secured from the giant epithelial cells. In other words: true thymus effect can only be secured when an extract of true thymus is available in a sufficiently concentrated and pure form to render it suitable for use in the treatment of carcinoma in the human. The earliest origin of the thymus is epithelial and it is logical to presuppose that the epithelial elements constitute the true thymus and contain the hormone peculiar to itself.

I have made use of an original method that breaks down the tissue structure of the thymus and excludes the fibrous tissue of the capsule and interlobular structure in addition to a large amount of the lymphoid elements. The extract apparently contains no nucleohistone as no precipitate is secured on the addition of acetic acid. Each c.c. of Karkinolysin (Hanson) represents 0.6 gm. of the fresh gland and has a protein content of about two per cent.

I give it intramuscularly for two reasons: first, because I know that it is effective when given this way; second, because there is much less local reaction and the comfort of the patient under treatment must be considered. It must be given daily in 1 c.c. doses as the lysin effect is best brought about in this way. Perhaps it could be given every twelve hours and in larger doses, but I have secured results by daily intra-

*From the Chemical Research Laboratory, Faribault, Minnesota. Read before the Rice County Medical Society at Faribault, Minnesota, December 11, 1929.

muscular injections of 1 c.c. in inoperable carcinomas involving the peritoneal cavity. This is pioneer work. The dosage is necessarily empirical, but I have found that 0.6 gm. of the fresh gland to each c.c. is about all the extract will hold and produce a clear product with the protein content at about two per cent.

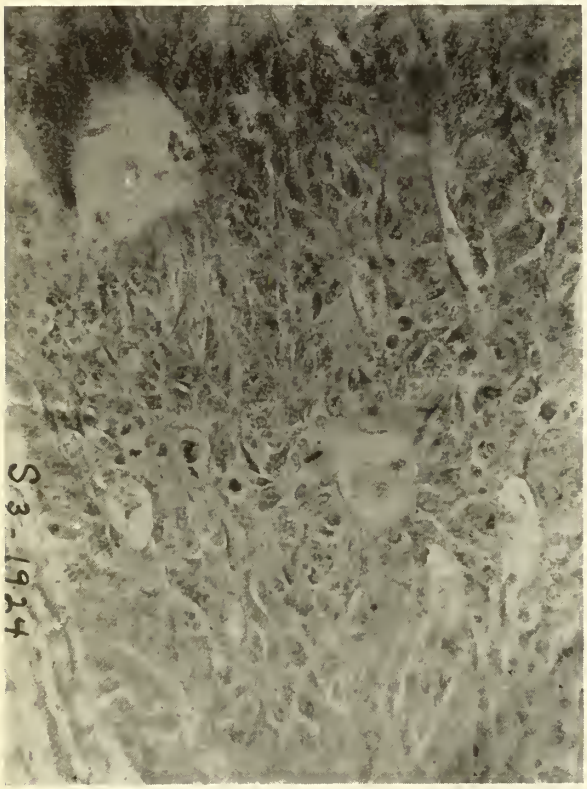


Fig. 1. Microphotograph of the tissue in Case 1, showing the cellular structure.

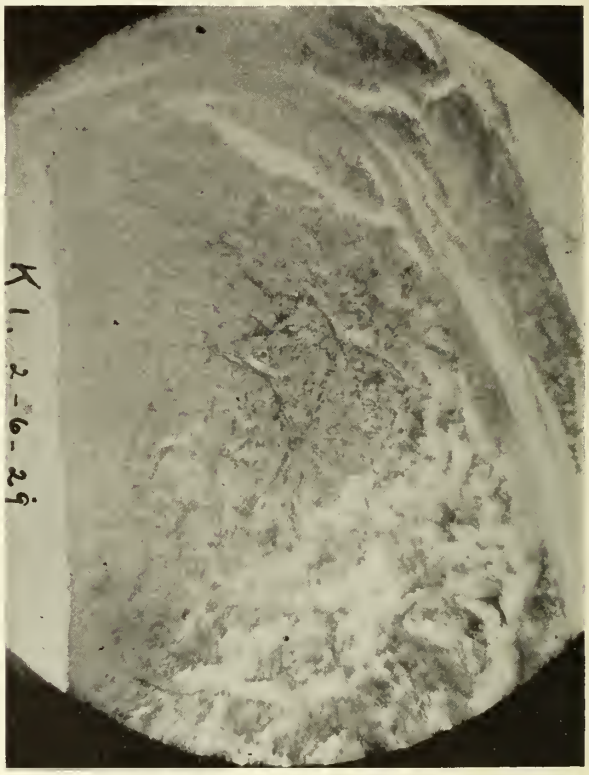


Fig. 2. Low power view of gland removed from patient in Case 2, showing the malignant growth extending beyond the capsule of the gland.

The treatment is carried out by daily intramuscular injections for three to six months, or thirty days beyond the time when all evidence of the disease has disappeared. Such cases must be under the absolute control of the physician, preferably in a hospital.

Engel† emphasizes that in our research on cancer we often consider it as a local affection and overlook the organism as a whole, and yet it is the general condition which determines whether malignant disease may develop or not. Engel relates a report by Rüder of a family in which all seven of the sons developed epithelioma of the skin at ages varying from five months to ten years. There were five girls in this family and all of them escaped such development. Incidentally, the grandfather also had epithelioma of the skin. Of the five sisters, two died of primary carcinoma of the liver which was discovered at autopsy. Attention also is called to the report of Freund and Kaminer that the serum and extract of the organs of cancer subjects do not destroy cancer cells in the same way as do the serum and extracts of organs of the non-cancerous. It has been demonstrated further that this faculty is twenty-one times more potent in the serum of infants than in adults, and this peculiar potency is believed to be connected with the thymus, since the potency declines as the thymus gland retrogresses.

Engel has been experimenting with the protein extracts of various endocrine glands as devised under the methods outlined by Abderhalden, the so-called "optones." He injected such solutions subcutaneously into mice at points remote from the experimental inoculations of cancer. As a result of his work, light is thrown on the potency of these protein products of different endocrine glands and on the influence of the different glands upon the production and inhibition of tumor growth. For instance, it seems that extracts of pituitary tend to promote such

†Engel: Zeitschrift für Krebsforschung, 19:339 (Feb.), 1923.

growths, while extracts of thyroid, and especially the thymus, check it remarkably. The elements responsible for this action seem to be the protein products.

This report led me to consider the possibility

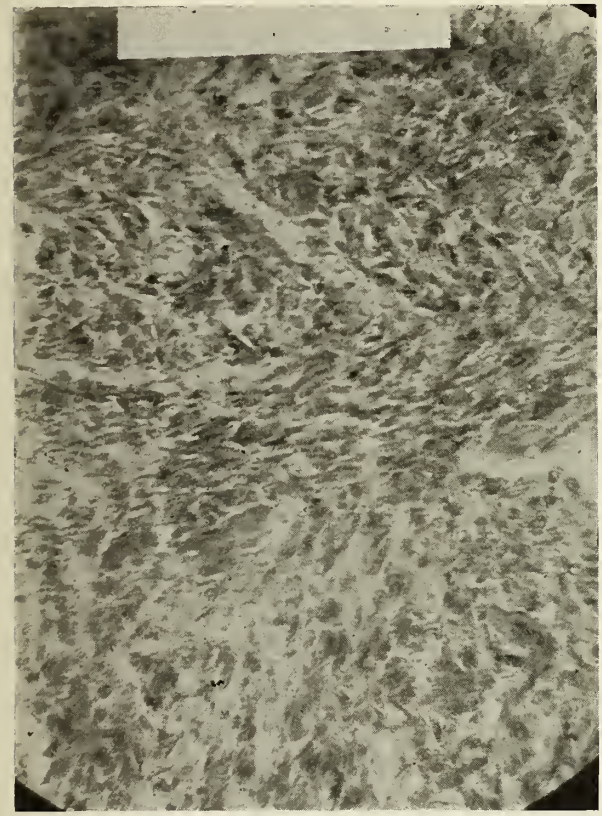


Fig. 3. The general arrangement is shown of the cells in rows in the gland removed from patient in Case 3.

of extracting true thymus activity, and in laying my groundwork for this study I decided to make a histological study of the bovine thymus and to study it grossly in the animal. This was followed by the chemical work in my laboratory which resulted in the production of Karkinolysin, the extract of thymus which has been used in the cases which follow.

CASE REPORTS

Case 1.—Mrs. J. S. White. Married. Age 56.

This woman was brought to St. Lucas Hospital, Faribault, Minnesota, on January 23, 1924, suffering from almost complete obstruction of the splenic flexure of the colon, which became complete, necessitating operation on January 28, 1924. At operation a large annular carcinoma, the size of a clenched fist, was found at the splenic flexure, completely occluding the bowel. It was densely adherent to the surrounding structures and a few enlarged glands were palpable. The transverse colon was fixed in a left inguinal wound and a fecal fistula established forty-eight hours later. On February 6, 1924, my first thymic extract was given intramuscularly in a dosage of 1 c.c.‡

One c.c. was given intramuscularly on the following day, and 2 c.c. intramuscularly every day thereafter un-

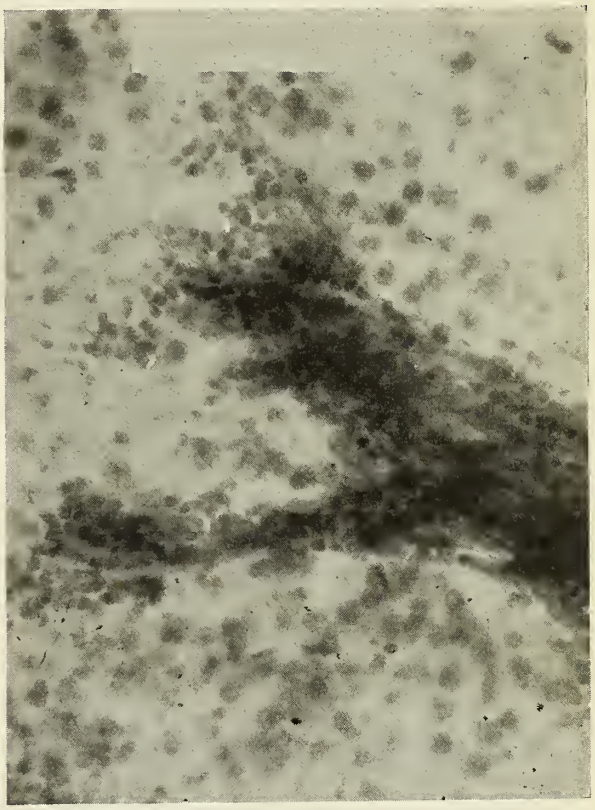


Fig. 4. High power microphotograph, Case 3, showing the end of a trabecula in the gland surrounded by the metastatic epithelial cells.

til February 25, 1924, when the last injection was given. A total of twenty injections were given: 2 of 1 c.c. each, and 18 of 2 c.c. each.

On February 26, 1924, the abdomen was again opened and much to our surprise the mass was much reduced in size, in fact smaller than the circumference of the normal colon, so that it appeared as though a band had been tightly drawn about the bowel constricting it. It was no longer adherent to the surrounding structures and the enlarged glands had disappeared. The splenic flexure, with its hard constricted area, was brought well outside of the abdomen and fixed by interrupted sutures. On February 28, 1924, the loop of extruding bowel was removed by cautery and large clamps applied to re-establish anastomosis.

This patient enjoyed perfect health, with the excep-

‡My first thymic extract used clinically represented only 0.03 gm. of the fresh gland to each c.c. of extract. Even when given in intramuscular doses of as high as 4 c.c., an amount of extract representing only 0.12 gm. was received by the patient. Karkinolysin, a similar extract, represents 0.6 gm. of the fresh glands to each c.c. The fact that results were secured by this crude and weaker extract suggests a hormonal action.

tion of an occasional slight discharge from a small sinus, which persisted at the site of the original fecal fistula, until the illness which resulted in her death from pneumonia in the late spring of 1928. Dr. Theodore Holtan of Waterville, Minnesota, under whose care she was at the time, stated that there was no evidence of recurrence of the malignancy at the time of her death. This



Fig. 5. Low power microphotograph of the tissue from the left ovary removed on June 19, 1929, Case 4.

patient received no *x*-ray treatments while in the hospital.

A good stained and mounted tissue section was prepared from a block cut from the gross specimen at the St. Lucas Hospital Laboratory on October 29, 1929. Its description follows:

Splenic flexure of colon 5 years after resection.

Gross Description: The tumor mass is in two parts (bowel divided in its long axis), each consisting of a solid central portion with a short segment of bowel extending out from it in directions nearly at right angles. The solid mass interposed between the two portions of intestinal lumen is fully an inch through. The tissue for examination was a block extending from the open gut into and half way through the solid mass.

Microscopic Description: This tissue on section is seen to be composed largely of hyperplastic abnormal masses of cells, showing clearly basic granular structure. Numerous tubular openings, cut in various directions, are present, lined by columnal epithelium; but these are embedded in irregularly shaped masses of epithelial tissue, clearly malignant in type. Mitoses are abundant. The other portions of the tissue are merely fibrous connective tissue, such as is normally found in connective tissue gland structure.

Summary: Adenocarcinoma.

Case 2.—Mrs. T. J. D. White. Married. Age 42.

This case was diagnosed as carcinoma involving the greater curvature of the stomach by Dr. S. B. Haessly of Faribault, Minnesota, following an *x*-ray examination, and operated upon by him on July 29, 1925.

At operation a large irregular hard mass, the size of a grapefruit, was found in the posterior mid-wall of the stomach, involving the greater curvature and

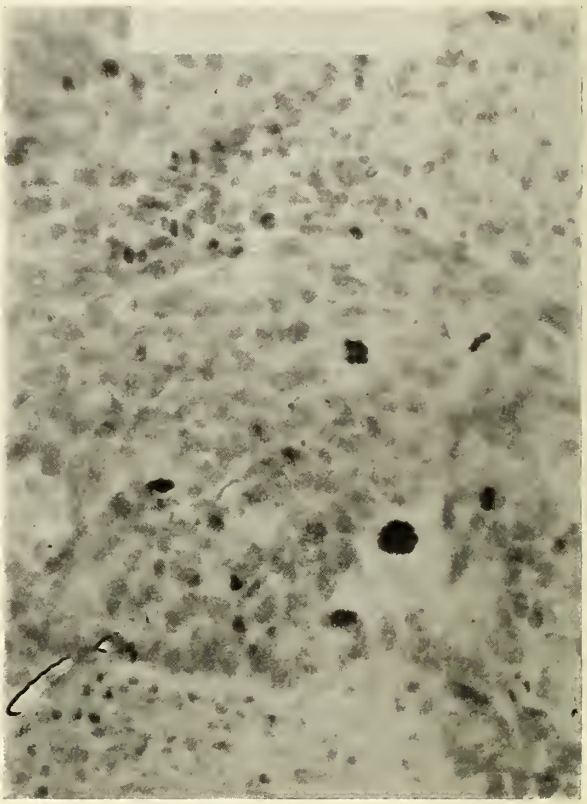


Fig. 6. High power of an area of the preceding illustration, revealing the character of the cells and the active mitosis generally seen through the section.

the lesser peritoneal cavity. The omentum, parietal and visceral peritoneum were studded with widely scattered metastatic growths. A section was removed from the tumor mass in the stomach for microscopic examination.

The tissue at the time was diagnosed from frozen section as adenocarcinoma, but the slide has been lost so I regret that I cannot offer proof of its structure. However, in the light of the other cases reported, it is not devoid of interest.

The record of the injections of my thymic extract given in this case is incomplete. She received the first injection on August 4, 1925. Ten daily intramuscular injections were given in succession, the patient being discharged from the hospital on August 15, 1925. No more injections were given until April 8, 1926, when the patient had gradually become much worse and returned for treatment. From that time, until and including June 12, 1926, she received thirty intramuscular injections in the buttocks, ranging from 3 to 4 c.c., sometimes every day, sometimes three to four days

apart. The tumor mass, eventually, could no longer be palpated. She gained in weight, took on a robust appearance and when last heard from was in good health.

Case 3.—M. A. K. White. Male. Married. Age 35. This man consulted me on December 17, 1928, giving a history of having had stomach and bowel trouble for the last five years. He complained of constipation and

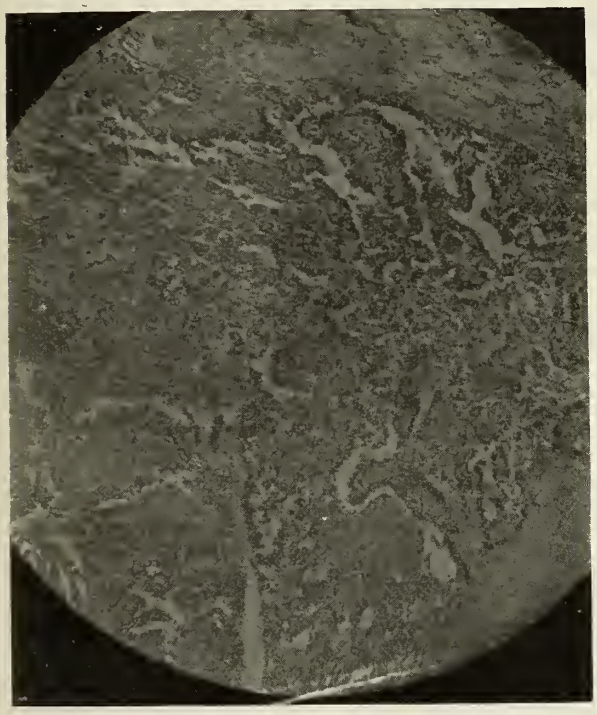


Fig. 7. Relatively low power microphotograph of the metastatic growth removed from patient in Case 4 on June 19, 1929, revealing the papillary growths.

severe cramps in the bowels. He had had obstruction of the bowels two years previous and was very sick. He has had two similar spells since that time, though they were not so severe.

After much study and delay, finding only a spastic condition at the recto-sigmoid junction and a gradually enlarging mass in the left abdomen, an exploratory operation was advised. Sugar in the urine was found on several occasions.

The abdomen was opened by a large left rectus incision on February 2, 1929. A large hard nodular mass, the size of a man's head and half as thick, was found retroperitoneally, extending from the region of the tail of the pancreas along the aorta, to which it was adherent, to the brim of the true pelvis. It was bound down by dense adhesions to the middle and lower thirds of the descending colon. There were palpable glands as large as hazelnuts. One of these glands, densely adherent over the mass, was removed for section and microscopic examination.

Gross Description: A small ovoid mass, about ¾ inch long, enclosed in a fibrous capsule, on section showed a grayish interior.

Microscopic Examination: Microscopically, this showed remnants of typical lymph-gland trabeculæ and a certain amount of lymphoid tissue adjacent to them. The major portion of the interior, however, was made up of larger cells, having epithelial characteristics, densely packed together and in places giving the indistinct appearance of being arranged in rows. The general impression is that of an invasion of lymph gland by metastatic growth of the larger cells which have

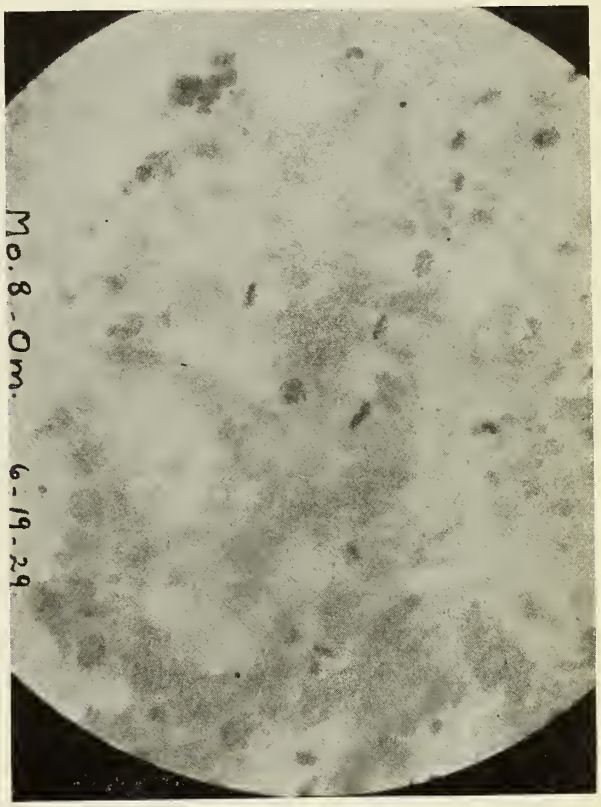


Fig. 8. High power of Figure 7, showing the character of the malignant cells and the numerous and varied mitotic figures.

invaded this gland, but whose source cannot be definitely determined.

Summary: Carcinoma of unknown origin.

On March 4, 1929, he received his first intramuscular injection of 1 c.c. Karkinolysin. From this time to July 26, 1929, he received fifty-one 1 c.c. intramuscular injections of Karkinolysin.

On August 14, 1929, he returned, complaining of pain in the left side of his neck, head and left arm. Large glands could be palpated in the lower posterior triangle of the neck on the left side. A blood examination at this time revealed: R.B.C. 5,440,000; W.B.C. 5,000. Differential Count: P.M.N. 65; lymphocytes 23; mononuclears (large) 5; eosinophiles 1; myelocyte 1; undetermined 5.

On August 26, 1929, he received Karkinolysin 1 c.c. intramuscularly. He did not return until September 21, 1929, when the mass was the size of a large apple and the pain and discomfort was so great that he received no relief from large doses of morphine hypodermically. He could not sleep at night and the pain was almost unbearable.

On September 27, 1929, I made the following notation on his history record: "Metastasis at the site of the thoracic duct emptying into the left subclavian vein." After three daily 1 c.c. intramuscular injections of Karkinolysin, he stated that he could turn over in bed and that the pain was much relieved. After seven injections, on October 4, 1929, the record notes that the swelling in the neck is decreasing rapidly. After fourteen injections, the last on October 17, 1929, he did not return until October 20, 1929. At that time, he stated that he had severe chills on October 18 and thought that he was coming down with the "flu" and did not dare to venture out the next day. His temperature was normal; he felt well and seemed perfectly well on October 20, and the mass in the neck was no longer apparent and barely palpable as a small soft mass, the size of a small hazelnut, behind the left clavicle deep in the neck. The Karkinolysin treatment was continued daily and he is still receiving daily injections.

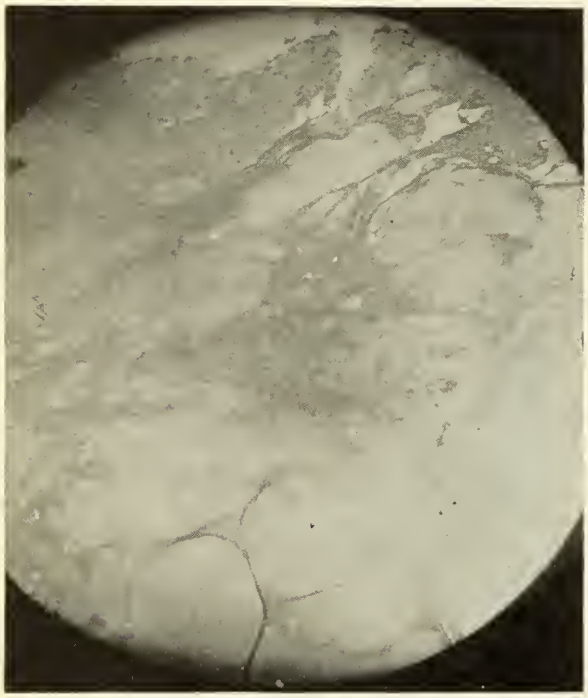


Fig. 9. Low power, showing the general appearance of the tissue from the right ovary removed from patient in Case 4, August 30, 1929.

On March 19, 1929, this man weighed 152 pounds; on July 16, 1929, 157 pounds; on September 29, 1929, 164 pounds; and on October 20, 1929, 167 pounds.

The abdominal tumor is no longer palpable and, at the time of writing this paper, he feels better than he has felt since two months prior to his operation.

Case 4.—Mrs. A. A. M. White. Married. Age 49. This woman consulted me on April 27, 1929, complaining of soreness in the abdomen, heartburn and indigestion—worse last fall and again this spring. Cystitis symptoms were present with a soreness in the pelvis. She had not menstruated since January, 1929, and was very irregular the preceding year. After thorough examinations, a diagnosis of large multiple fibroids was made and operation advised. She was operated upon on June 19, 1929, at which time the gross findings were malignancy involving both ovaries, omentum, and the peritoneum of the anterior abdominal wall and pelvis. Three large metastatic growths were found in the omentum.

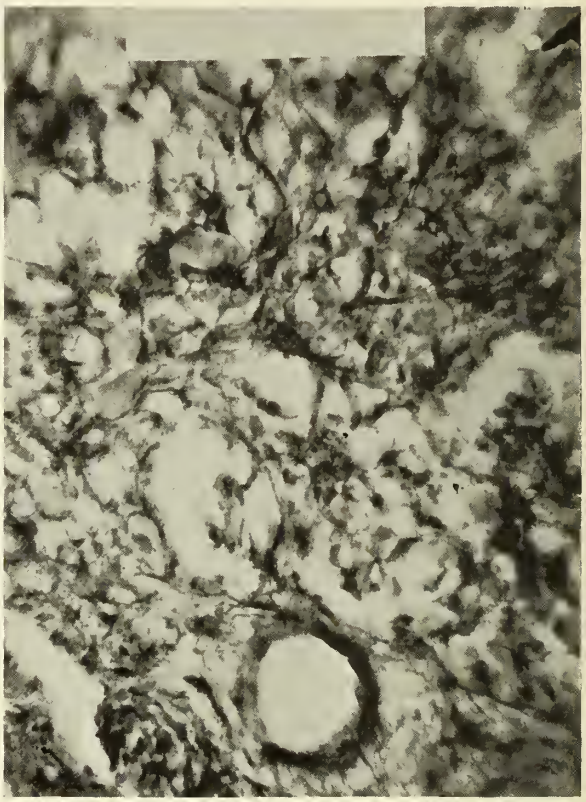


Fig. 10. Appearance of a small area under the high power, showing the general appearance of the tissue and the absence of cellular elements in the right ovary, Case 4.

The right ovary and uterus were so densely adherent over the iliac vessels and in the pelvis that removal was impossible. The large left ovary and one of the metastatic growths in the omentum were removed and delivered to the St. Lucas Hospital Laboratory.

Gross Description of Ovary: Large multilocular ovary containing hard masses and numerous cysts.

Microscopic Description of Two Blocks of Tissue Removed from Left Ovary:

1. This is composed mainly of closely packed epithelial cells surrounding numerous rounded and elongated spaces which are lined by simple columnar epithelium, not set off from surrounding cells by basement membrane. Many of these spaces contain bood-cells. Others are filled by a substance resembling colloid of the thyroid gland, while still others are empty. Throughout this epithelial tissue, mitotic figures are abundant. This section contains almost no connective tissue, except that along one margin. A thick band representing a part of an enclosing capsule is seen.

2. This section consists of a network of broad bands

of connective tissue, within and between which are spaces only partly filled by epithelial cells which line the spaces, in places as a simple columnar epithelium with a distinct gland-like lumen, in others being filled with piled up masses filling the spaces more or less completely, while in still other places there are distinct papillary extensions from the epithelial wall closely packed. The framework is infiltrated with small round cells in places. In others it appears as essentially normal ovarian stroma.

These various conditions evidently represent various stages in adenomatous transformation towards massive or solid carcinoma. The abundant mitoses and abundant blood supply indicate a high degree of malignancy.

Summary: Rapidly developing papillary adenocarcinoma of cystic ovary.

Gross Description of Metastatic Growth in Omentum: The omentum is greatly thickened (¾ inch thick). The whole surface is covered by masses of fatty tissue about the size of a grain of wheat. When cut open, however, the interior is largely made up of white rounded masses of varying size from that of a pinhead to that of a pea.

Microscopic Description of Section from Metastatic Mass in Omentum: Upon microscopic examination these white masses are found to be cysts more or less completely filled by papillary ingrowths from the walls. The papillary growths are covered by columnar epithelium which is simple lining layers in some, but in older growths is piled up in layers of several to many thicknesses, nearly filling the lumen of the cysts. The mitotic figures are very numerous in this epithelium and the blood supply is abundant.



Fig. 11. Microphotograph under low power showing the appearances of the metastatic growth removed from patient in Case 4, August 30, 1929. Note the large area of myxomatous-like tissue in the center, separating cellular areas.

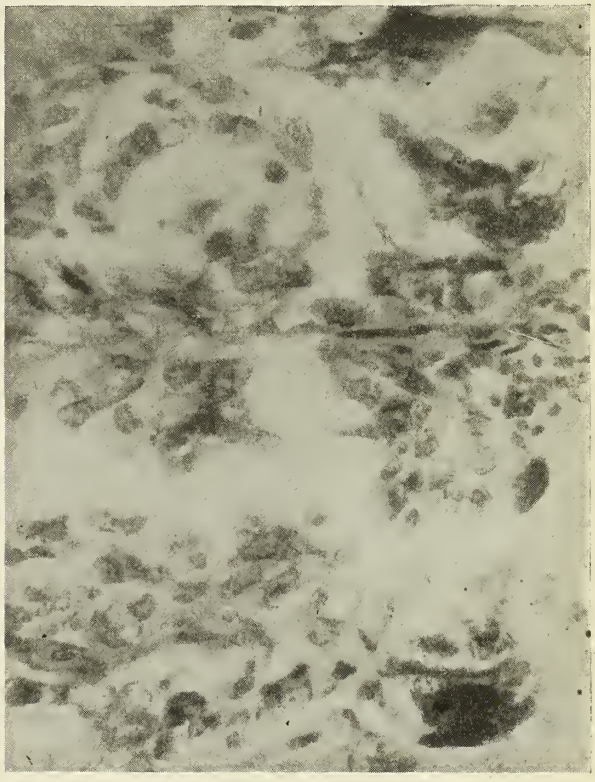


Fig. 12. High power microphotograph of an area of Figure 11, showing the general average appearance of the cellular portions. Note the poor staining qualities of many of the cells and the relatively large areas in which the cells are no longer found.

Summary: The metastatic omental growth is a papillary cystic adenocarcinoma.

The patient in Case 4 was discharged from the hospital on July 4, 1929, and the Karkinolysin treatment was started on July 16, 1929, daily injections being given. On August 2, 1929, the remaining mass was much smaller and she complained of very little tenderness. On this date she received 1.5 c.c. Karkinolysin intramuscularly and her weight was 166 pounds. From that time until August 25, 1929, she received three injections of 2 c.c. each. Her weight on August 25, 1929, was 176 pounds and she felt very well, though she had had several slight hemorrhages from the uterus and the abdomen was rapidly growing larger.

On August 30, 1929, she was again operated upon because of the large cystic right ovary, which was causing increased discomfort in that it distended the abdomen like a large full-term pregnancy. At operation it was found that the large cystic right ovary was completely free from the iliac vessels, except where

densely adherent to the uterus. The adhesions had largely disappared and the two remaining omental metastatic growths, which were left at the first operation in June, were apparently no larger and no evidence of more growths could be found. The glands in the pelvis and the growths in the peritoneum of the anterior abdominal wall had disappeared. The enlargement of the right ovary was entirely due to the formation of more fluid within the cysts, of which quarts were evacuated, and most of the remaining right ovary was removed. At its attachment to the uterus, the uterus was deeply cauterized with the Percy cautery. The two remaining metastatic growths in the omentum were removed with parts of the omentum and with the ovarian tissue were delivered to the St. Lucas Hospital Laboratory. It was necessary to sever the right broad ligament to expose the attachment of the ovary to the uterus.

Gross Description of Tissues: Masses of right ovary in four pieces, which include practically all of right ovary. Two large pieces of omentum. The pieces of ovary are changed so that there is no anatomical resemblance to ovary, but are simply masses of white tissue. The pieces of omentum each contain a hard mass made up of closely adherent masses of carcinomatous-like tissue and represent areas all the way from the size of a pinhead to the size of a walnut.

Microscopic Description of Ovary: No mitotic figures seen. The spaces previously occupied by epithelial growths are represented by a very loose myxomatous-like tissue. Epithelial cells have disappeared. Blood supply not conspicuous.

Summary of Ovary: Myxomatous-like tissue replacing epithelial tissue.

Microscopic Description of Omental Metastatic Growths: Much epithelial tissue in dense masses showing very little open space between the masses. The papillary framework of the epithelial tissue has largely disappeared, so that the epithelial tissue appears to be nearly solid masses surrounded and enclosed by strings of fibrous framework. Some extravasated blood found between epithelial tissues, which may be the result of trauma. Various degenerative changes in the cells with vacuolization and cell-death. The structure of the nuclei is faint and indefinite. No mitotic figures seen, except in one small area (see slide marked "X") where the cells appear clean cut with well defined nuclei and among which mitotic figures are seen. The small area in this section is in sharp contrast to the rest of the section, and other sections.

The author realizes that the diagnoses of types of malignancy may be questioned by experts in this field, but he hopes that the descriptions of the tissues, with the clinical and operative findings, will offer sufficient evidence of malignancy and the changes which took place after treatment.

In the last mentioned case, the only case in which it was possible to note clinical, operative and pathological findings before and after treatment by Karkinolysin, the significant facts are:

The disappearance of enlarged glands and growths in the peritoneum (also noted in the first case reported);

The arrest of metastasis;

The changes in the original metastatic growths, which are: a breaking down of the malignant cells with vacuolization, fading staining qualities and indefinite nuclei; their replacement by a myxomatous-like, or fibrous-like, tissue; and the almost total absence of mitotic figures, and these only found in one small isolated area, like one remaining machine-gun nest after all the rest of the enemy has been wiped out.

I do not attach great significance to the microscopic appearance of the right ovary (having failed to remove a section from this ovary at the first operation), as it may be argued that malignancy never existed in the right ovary. The same cannot be said about the metastatic omental growths. The fact, however, that this right ovary was densely adherent in the pelvis and to the iliac vessels at the first operation and that these adhesions had disappeared at the time of the second operation is suggestive of malignancy in this ovary, also, and a lysin effect from the treatment.

This last patient had a discharge from the wound for some weeks following the operation and a high temperature. This discharge contained small particles of tissue, possibly from the cauterized area in the uterus. At the time of the writing of this paper she is steadily improving and the uterus is diminishing in size. No more uterine hemorrhages have occurred.

In the first three cases reported, we have only the operative and clinical evidence of carcinoma, with seemingly pronounced benefit in two of them, the tissue evidence of one of them being lost. In two of them we have the pathological tissue as evidence of carcinoma.

The last two cases are too recent to state the condition three to four years following treatment, but the tissue studies in the last case, before and after ten weeks treatment, are significant. The microscopic examinations of the tissues removed at the first operation in the last reported case indicate a high degree of malignancy. Whether or not this case becomes eventually apparently cured, or other rapidly growing cases of malignancy will respond so readily, or become arrested in every instance, remains to be seen when nuerous cases have been treated over periods of three to six months, or longer. If Karkinolysin will give relief in only fifty per cent of the cases and prolong life, even if it does not result in permanent cure, it will be a great boon to humanity. In view of the fact that this case was a rapidly growing malignancy of high degree, the findings are only the more significant.

It has been impossible to treat all of the carcinoma patients who have been under the au-

thor's care since 1924 with Karkinolysin. Only the cases of inoperable carcinoma that could be induced to submit to experimental treatment and who stayed by it could be used in this work. After five years, this is all I have to report. The chemical work, which has been the greatest task of all, will not be reported unless it can be shown that Karkinolysin is of as real value as my clinical experience seems to indicate in these four cases. If clinical investigators can duplicate and multiply these results, Medicine will take another step in the right direction. I feel that it is deserving of such a trial, as Karkinolysin is an exceptionally pure extract, with a protein content of only about two per cent. A substance that can bring about such changes in carcinoma as Karkinolysin has accomplished in these four cases deserves our most serious and earnest attention. I do not offer it as a cure for cancer, but as a cancer-solvent, a product that seems to inhibit cancer by breaking down the malignant cells and replacing them by non-malignant issue. The object of my study has been: WHY CANCER? I hope that I am correct in my supposition that cancer is due to a hypothemia, or an athymemia, and that Karkinolysin replenishes this deficiency in the body.

All of these cases received a few deep *x*-ray treatments after leaving the hospital, but the effect was necessarily negligible, especially in the treatment of the abdominal growths, as the *x*-ray machine used was not a heavy duty treatment apparatus, was not capable of carrying a heavy load and no water-cooled tube was available.

SUMMARY

The four cases treated have all shown definite temporary improvement. The treatment seems to cause a necrosis, softening and absorption of at least a part of the tumor. Whether or not a complete destruction takes place has not yet been determined. This may be a partial destruction, as occurs in some cases treated by lead and *x*-rays. That this effect may be due to a foreign protein must also be cosidered.

ACKNOWLEDGMENTS

I am greatly indebted to W. S. Nickerson, M.D., Sc.D., for his study of the pathological tissues reported in this paper; to Sister Amalia of the St. Lucas Hospital Laboratory for the taking of the microphotographs and her assistance in preparing tissue sections; to Dr. S. B. Haessly of Faribault, Minnesota, for consenting to and treating the second case in this series; to Dr. Theodore Holtan of Waterville, Minnesota, for the continued treatment of the last case reported; to E. O. Ellingson, Ph.D., Professor of Chemistry at St. Olaf College, Northfield, Minnesota, for Kjeldahl checks to accurately determine the protein content of Karkinolysin; to Sister Caroline and the Operating Room nurses at St. Lucas Hospital for the autoclaving of my 10 c.c. vials in which Karkinolysin is distributed to clinical investigators and laboratory workers; and to Swift & Company and their Mr. C. P. Kaufmann for their always helpful coöperation in so promptly furnishing me with fresh neck-thymi from young calves for my chemical work.

REFERENCE

Hanson, Adolph M.: The Bovine Thymus: A brief description and histological study. Minn. Med., 13:17 (Jan.), 1930.

Note: Other cases are now undergoing treatment by the author and other investigators. If my results can be duplicated, other reports will be made by various investigators regarding its use in the treatment of carcinoma in human beings, as well as its effect in carcinoma in rats. A publication in the near future will describe the method used in the preparation of Karkinolysin.

THE TUBERCULOUS CHILD*

J. A. Myers, Ph.D., M.D.
Minneapolis

THE brightest beacon that has ever lighted the paths of warriors against tuberculosis is our newer knowledge and better understanding of the disease in childhood. Through tuberculosis in this age period we hold the master key to doors that have never been open. We must learn to manipulate the key, otherwise the tubercle bacillus will continue as in the past to deal out destruction and death behind locked doors. The best method of attacking the tuberculosis problem consists of searching for tuberculous children. The following are some of the reasons why childhood is the best age period in life to study and teach tuberculosis:

1. The mind of the child is impressionable.
2. The mind of the child is retentive.
3. Children are gathered together in large groups.
4. Consent for examination is more easily obtained than in later life.
5. The tuberculosis of a community is reflected in the children of that community.
6. Tuberculosis from first infection in the body of a child is often reflected in the lung hilum region even when the initial lesion is in some remote part.

Most tuberculous children can be found by use of the tuberculin test, which, as it is applied to detect tuberculous infection in children, is harmless.

The *intracutaneous or intradermal (Mantoux) test,* because of its greater accuracy and its measure of hypersensitiveness to tuberculin, is the best of all the tuberculin tests. It has become the standard test. The following technic is employed: The surface of the skin where the test is to be applied (the forearm is usually a convenient place) is cleansed with alcohol. An accurately graduated tuberculin syringe containing a solution of old tuberculin of such strength that 0.1 c.c. contains 0.1 mgm. of tuberculin is fitted with a 26-gauge one-half-inch needle. The needle is placed almost parallel to the surface of the skin and is gently inserted into the superficial layers. It must not pass beneath the skin. When the tip of the needle is introduced with the bevel up so the lumen is just out of sight 0.1 c.c. of the solution is slowly forced from the syringe into the skin, where it produces a wheal similar to that seen immediately after applying the Schick test. If there is no reaction in six or seven days the same procedure is repeated but with a solution of such strength that 0.1 c.c. contains 1.0 mgm. of tuberculin. If there is no reaction in six or seven days one may conclude the child is not now infected. When a positive reaction does occur either with 0.1 or 1.0 mgm. of tuberculin, it is usually visible within twenty-four to forty-eight hours after the administration. Occasionally the reaction is delayed. Therefore, when the test is negative we wait approximately one week before applying the second test. There appears a definite deep red nodule which varies in size from one-half to one inch in diameter and surrounding this nodule is a good sized pink halo. This, in extreme reactions, may extend over the greater part of the forearm.

To obtain the proper dilution of tuberculin, take 0.1 c.c. of old tuberculin and add 9.9 c.c. of filtered solution of c. p. physiological saline (0.85 per cent). This is known as dilution A. Of this dilution 0.1 c.c. contains 1.0 mgm. of tuberculin, which is the dose used when necessary to apply a second test. To prepare the dilution for the first test, to 0.1 c.c. of dilution A add 0.9 c.c. of the physiological salt solution. Of this dilution 0.1 c.c. contains 0.1 mgm. of tuberculin. When larger quantities are desired 1.0 c.c. of Koch's old tuberculin to 99.0 c.c. of physiological salt solution gives the dilution for the second test while 0.5 c.c. of tuberculin to 499.5 c.c. of salt solution gives the dilution for the first test. These dilutions should be made fresh every two or three weeks, as they deteriorate. A preservative consisting of 0.33 per cent tricresol or 0.25 per cent phenol may be added. Such preserva-

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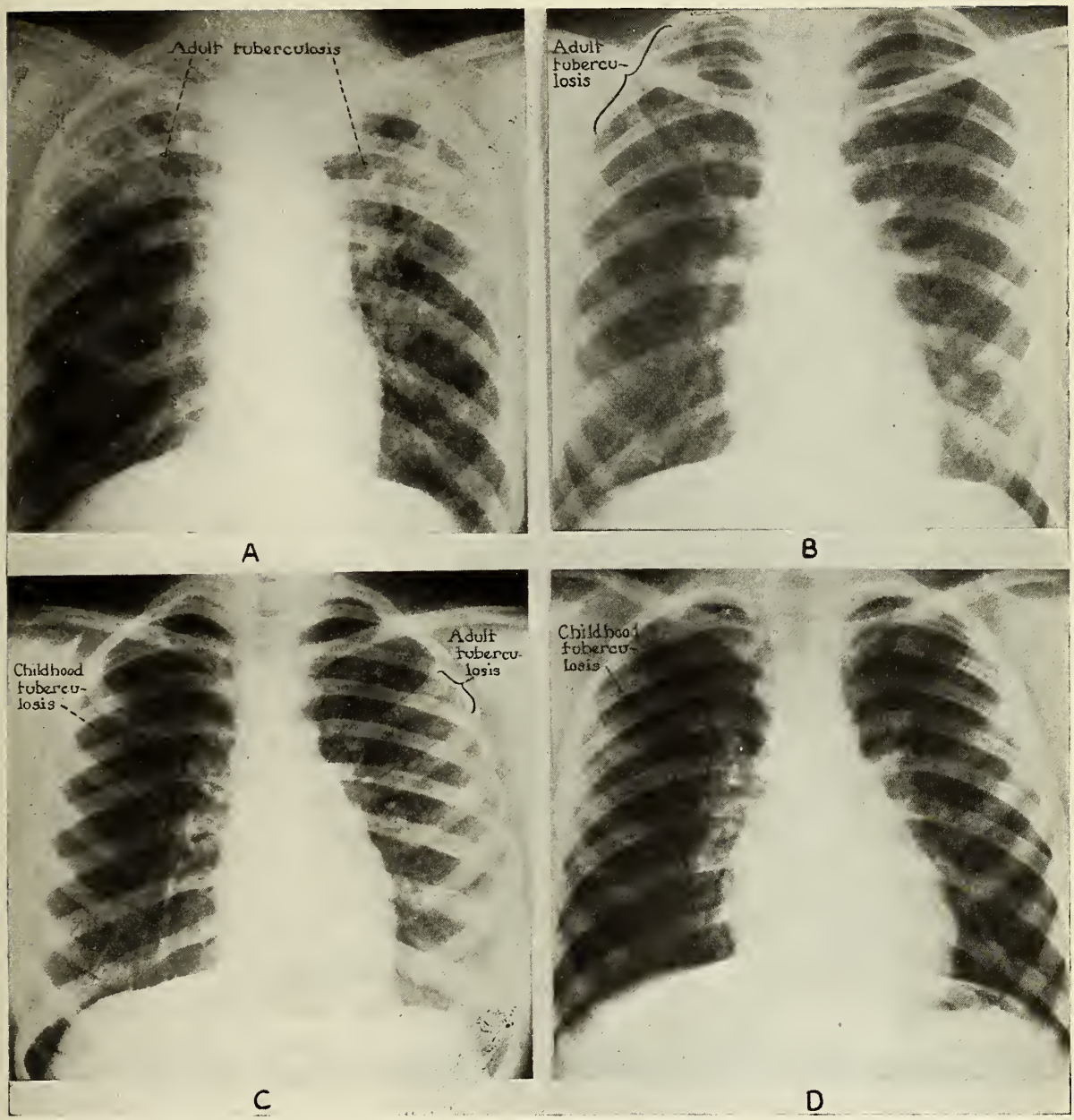


Fig. 1. Roentgenograms of four members of the same family. In 1923 a girl of fourteen years developed pleurisy with effusion. No history of tuberculosis could be obtained. Treatment was refused. In 1925 she died of pulmonary tuberculosis. The source of her infection was still unknown. Inquiry among members of the family revealed the fact that her father had been coughing with a diagnosis of bronchitis since 1920. He was advised to be examined. A few months after the daughter's death he had a frank hemorrhage from the lungs. Examination revealed chronic fibroid pulmonary tuberculosis. Thus the source of the fatal infection was pretty definitely determined through first finding disease in the child. Precautionary measures for the remaining three children were strongly recommended, but not practised. The chest conditions in this family in the spring of 1929 are seen in the illustrations as follows:

A. J. H. Father. Age thirty-nine. Roentgenogram taken May 31, 1929. Advanced bilateral pulmonary tuberculosis, adult type. Not especially ill, but gradually losing in weight and strength.

B. P. H. Daughter. Age sixteen years. Roentgenogram taken June 5, 1929. Childhood type of tuberculosis right hilum. Pulmonary tuberculosis, probable adult type with cavitation right upper lobe. Symptoms present.

C. A. H. Daughter. Age fifteen years. Roentgenograms taken June 5, 1929. Childhood type of tuberculosis in the right hilum. Parenchymal involvement, probable adult type in the second interspace on the left side. No symptoms.

D. M. H. Son. Age eight years. Roentgenogram taken June 5, 1929. Childhood tuberculosis right hilum. Apparently in good condition.

tives cause some precipitation and therefore require that fresh solutions be made every ten or twelve days.

Other tuberculin tests such as the epidermal (Pirquet) and percutaneous (Moro) and their numerous modifications have been extensively used, but the discrepancy between them and the intradermal test has been pointed out so often

that they are rapidly being discarded and the intradermal test has become the standard tuberculin test.

If the epidermal or percutaneous tests are used, there may be an error of approximately 10 per cent. Therefore, to all who react negatively to these tests the intracutaneous test should be applied. All children who react positively should have *x*-ray examinations of the chest. The number requiring this procedure will vary a great deal in different parts of the country and in different sections of the same city. Slater observed that only 10 per cent of the children in a rich rural community reacted positively. Hetherington has found that 72.6 per cent of the children of certain schools in Philadelphia react positively. Chadwick and Zacks report that 11 per cent reacted positively in one section of a city whereas 60 per cent were reactors in another section of the same city. McCain has found 22.7 per cent of the whites and 27.34 per cent of the colored children react positively. In Rathbun's group 41 per cent of the children in the largest city and 25 per cent in the smaller towns of this county reacted positively to tuberculin. Mattill and Fenger have found approximately 22.5 per cent of the school children of small towns and rural communities reacting positively to tuberculin. Frost is finding about 26 per cent of the children with positive tuberculin reactions in a small town in his sanatorium district.

Thus, by first applying the tuberculin test, one reduces tremendously the amount of work necessary with the *x*-ray. In other words, if all children had to be *x*-rayed the problem would be quite insurmountable in many places.

In the earlier days of the study of tuberculosis among school children it was thought safe to select those below the theoretical normal weight, those with some symptoms of disease, and those from homes where tuberculous disease is known to exist, but careful observation has shown that very frequently body weight is not a safe criterion. Not uncommonly the boy or the girl considerably above the theoretical normal weight or even the athlete actively engaged in athletic sports at the time of examination is found to have tuberculous disease. Not infrequently open cases of tuberculosis exist in homes that have been entirely unsuspected. Therefore, there should be no selection whatsoever of cases but an application of tuberculin to all and *x*-ray studies of the positive reactors.

In the past we have been terribly misguided by physical signs. The childhood type of tuberculosis usually causes no abnormal signs. Often this is true even of the adult type. Therefore, many of the clinics that are held are of little value from the standpoint of detection of tuberculous disease in childhood. No one can doubt that the clinic has an educational value, but until we reach the time when tuberculin tests are applied to every child examined and all of the positive reactors have *x*-ray studies, our clinics will continue to be of little value from the standpoint of diagnosis.

What is childhood tuberculosis? It is that disease which results from first infection from tubercle bacilli. In the past we have frequently spoken of it as the primary lesion, as juvenile tuberculosis, puerile tuberculosis, hilum tuberculosis, etc., but the American Sanatorium Association in its recent meeting in Atlantic City placed these terms in the discard and in their stead substituted the term, childhood tuberculosis.

The primary lesion may be in any part of the body. It is often in the lungs. One of the characteristics of childhood tuberculosis is that in addition to producing an area of disease at the point where tubercle bacilli invade the tissues, there very quickly appears involvement of the lymph nodes, draining lymph from that area. For example, if tubercle bacilli find lodgment in the parenchyma of a lung there will usually appear around the focus a definite area of inflammation. This may be small or it may be large enough to involve a whole lobe. Very quickly after the focus appears in the lung definite changes occur in the hilum and tracheobronchial lymph nodes on the same side. Careful *x*-ray studies will frequently reveal them. If the infection has been massive and exposure prolonged the childhood type of disease in the lung may go on to cavitation and even to fatal termination. The disease in the lymph nodes of the hilum and in the tracheobronchial nodes may also continue to progress until tubercle bacilli in large numbers find their way into the blood stream and the child dies of generalized tuberculosis.

Such, however, is not the rule in childhood. There is a strong tendency for childhood tuberculosis to heal so that as time passes the

parenchymal involvement which was surrounded by an area of inflammation shows a gradual decrease of the inflammatory process until it may completely disappear as far as *x*-ray shadows are concerned, or it may take on deposits of calcium or even may become surrounded by true bone so that by *x*-ray examination a dense shadow is cast by this small focus which we frequently speak of as Ghon's tubercle.

The tracheobronchial and hilum lymph nodes may show evidence of calcification in a very short time—five months or less, or they may remain caseous with no evidence of calcification for years.

By any phase of the examination of the living body which we know at present it is impossible to determine when the disease in the lymph nodes has completely healed. Therefore, they may be a potential danger to the child for a long time. We occasionally see such patients who are doing splendidly but who very suddenly develop generalized tuberculosis and die a meningitic death.

If the child survives it, and many of them do, some immunity or protection against tuberculosis is conferred. In other words, people who have had such disease and later develop tuberculous disease will suffer from the chronic adult type. The immunity usually is not sufficient to completely protect against massive and prolonged exposure; therefore, the child who has suffered from childhood tuberculosis should be protected from such exposure throughout the remainder of his life. This applies even to old age. If prolonged exposure is permitted the adult form of tuberculosis often develops. It usually makes its appearance in the upper part of one or both lungs. It is chronic largely because of the partial immunity which has been conferred by the childhood tuberculosis. This immunity results in a fixing of the tubercle bacilli wherever they find lodgment in the body. In other words, they remain, for the most part, in that place and are not rapidly swept off to the regional lymph nodes. Indeed, these nodes usually do not become involved in the adult type of tuberculosis. One sees rather frequently tuberculosis in the adult involving the upper lobe on one side with no involvement of the hilum or tracheobronchial lymph nodes in a patient who has unmistakable evidence of old childhood tuberculosis with a Ghon tubercle and definite calcification of the hilum and tracheobronchial nodes on the opposite side.

The outcome in such cases of adult tuberculosis will depend upon the continuation of exposure, the amount of immunity and the general resistance or well-being of the body. In general it may be said that the adult type of tuberculosis shows far less tendency to heal than the childhood type. In other words, it is the type that kills.

One point that we must keep in mind constantly is that the childhood type of tuberculosis may develop at any age in life. The person who reaches sixty or seventy years and has not previously been infected with tubercle bacilli but now comes in sufficient contact with them to contract tuberculosis will first develop the childhood type. On the other hand, the infant of one year or less who has had the childhood type of disease and whose exposure to tubercle bacilli continues, may develop the adult and highly fatal type.

Therefore, our great problems in dealing with tuberculosis among children are to stop prolonged exposure, and treat those who have become diseased. Many times the source of the exposure is not known. The best way to find the infected child is by tuberculin testing of all children, and the best way to find those with childhood tuberculosis is to *x*-ray the chests of all the positive reactors. When this is done one may find as many as three or four per cent with this type of disease. Thus there is a considerable discrepancy between the number of tuberculin reactors and those found to have childhood tuberculosis. Careful history usually reveals the fact that those with definite evidence of childhood tuberculosis have had prolonged and intimate contact exposure to the disease. It is easy to understand how children reacting positively to tuberculin but manifesting no evidence of disease by *x*-ray may have changes in the lung parenchyma or the hilum which are not sufficiently extensive to be detected by *x*-ray examination, or are obscured by shadows of the bony framework of the chest, the mediastinum and the diaphragm. Again the focus may be found in the cervical or mesenteric lymph nodes. Then, too, there are many children who receive their infections by casual contact exposure. The exposure may have been very indirect. Rathbun

believes that 75 per cent of the cases of adult type of tuberculosis appearing in the teen ages are recruited from children who previously had definite evidence of childhood tuberculosis. This greatly simplifies our problem for it is obvious that if we will detect childhood tuberculosis and institute the right procedure, we will be able to prevent much of the killing type of tuberculosis among our young adults. What are these procedures? From the childhood tuberculosis cases we must look to their associates for the source of infection. The source may be another school child or even a teacher. It may be a father or mother or some other relative who has died of the disease and hence the source has been removed. It may be a father or mother or some other relative whose disease has not been detected but may be diagnosed (Fig. 1), and the exposure stopped through this simple method. Many times since 1921 such findings have occurred at the Lymanhurst School for Tuberculous Children. By this method of approach we may save not only the child but also the unsuspected contact case, and we may save large numbers of children and adults who would have become exposed had the contact case not been detected.

Once the tuberculin testing and the *x*-ray examination have been completed and an attempt has been made to prevent further exposure our duties have not ended. Every child with a positive tuberculin reaction in whom disease can not be found should be kept under close observation. This applies to children who are studied in large groups, such as school children. The private physician who has a case of tuberculosis in a home such as a father or a mother is not discharging his full duty to the family when he treats that patient alone. Over and over again tuberculosis has been shown to be a family disease. When an open case exists in the family the infection will spread to 60 or 80 per cent of the members of the family, and in some cases as many as 100 per cent of the members become infected. Therefore, it is the physician's duty to apply tuberculin tests to all members of the family and as many of the other contacts as will consent, and carefully examine all who react positively. The child who manifests no evidence except a positive tuberculin test should be carefully examined at frequent intervals.

The Fresh Air School, although the name is bad in the light of present day knowledge, has done a great deal for children in different parts of the world. The first school of this kind was founded in Germany in 1904, and in 1908 a similar institution was dedicated in Providence, Rhode Island. Since that time many such schools have come into existence and from the idea evolved the Fresh Air Class Room. In 1904 and 1908 it was believed that "fresh air" took first place in the treatment and prevention of tuberculosis. Now we know that nature has well taken care of us so far as the chemical constituents of air are concerned even in most rooms where we live and work, and that in the treatment and prevention of tuberculosis air has been relegated to last place among the valuable factors employed. But along with the Fresh Air School idea came other factors in treatment such as conservation of energy and good nutrition. To such schools and class rooms are admitted not only children with tuberculous infection, but also children below par from other causes. We are hoping that the time is not far distant when the Fresh Air School and Fresh Air Class Room has a change of name, but that the work which is being done through them will be increased and continued all over the world. Summer camps for children when properly supervised are doing considerable good although the time spent in them is far too short. The physician in private practice who is assuming the responsibility for the health of the families among his clientele welcomes a school or a class room or even a summer camp where he can recommend that the infected children from his families be admitted for special care.

Another great movement was started with the Preventorium idea. The first institution of this kind in the world appeared in Farmingdale, New Jersey, in 1909. "Its purpose was to prevent the spread of tuberculosis by saving the children of tuberculous parents, removing them from their homes in city tenements, where the danger of infection was very great. It was organized on a broad, non-sectarian principle, to take children between the ages of four and fourteen, absolutely without regard to race, creed, or color." From that beginning many similar institutions have been developed. The people of Minnesota are extremely pround of the Ramsey County Preventorium, which under the medical direction of Drs. H. Longstreet Taylor and Everett K.

Geer has for many years contributed a wonderful service to the good health movement. In this institution are taken girls and boys many of whom have been made orphans by tuberculosis. Others are from families poverty stricken by tuberculosis. These children are taken into this splendid institution before they are definitely ill and while they are still good risks from tuberculosis. Special attention is given to the development of their bodies and minds so that many of them overcome their childhood disease and through the school department of the institution are prepared for life's work. This institution has prevented many children from developing the adult type of tuberculosis, exposing large numbers of contacts, becoming a charge upon the city or the county, and finally dying of tuberculosis. Hence the Preventorium idea is also economically sound.

That children tolerate tuberculous infection well if exposure is discontinued has been proved beyond doubt. Even infants will usually overcome it if conditions are good. Among more than 160 infants who were infected at the age of two years or younger, and many of whom are now of school age, we have found through our follow-up work at the Lymanhurst School for Tuberculous Children that only six have died of tuberculosis.

Every child who has developed childhood tuberculosis should have close medical observation, special care to conserve energy and to keep the body in splendid general condition. The child may not look ill; he may not feel ill; he may even be athletically inclined when the evidence is detected, but his diseased hilum nodes or even his parenchymal involvement if in the active stage may result disastrously. Therefore, every case with the childhood type of disease in the active stage should be placed on careful treatment. In the majority of cases the disease rather quickly enters upon a period of latency. This is the period when treatment should continue, but of a less drastic nature than during the period of activity. Latency may be maintained for years; that is, complete healing may not take place for a long time, in some cases even during the lifetime of the individual. Such children need greater care than that provided by the Fresh Air School or Class Room. They need a special institution for tuberculous children. The idea of the first institution of this kind in the world was conceived by Dr. F. E. Harrington, Commissioner of Health of the City of Minneapolis. This institution was dedicated on May 31, 1921, and became known as the Lymanhurst School for Tuberculous Children. It has already served more than one thousand girls and boys. A second school of this kind was founded by Dr. W. P. Shepard and his associates in Berkeley, California, and is known as the Sunshine School. No physician desires to see children among his clientele grow to young adult life only to be stricken down by tuberculosis; therefore, every physician welcomes our newer knowledge and better understanding of tuberculosis in childhood that promises most in the control of tuberculosis.

RELATION OF PHYSICAL FINDINGS TO LUNG PATHOLOGY*

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THE physical diagnosis of pulmonary disorders is far from being an exact science although certainly based upon exact scientific principles. Like many other diagnostic methods it should be considered as an aid in arriving at correct conclusions. So many different conditions may masquerade under such similar physical signs that we frequently find it very necessary indeed to resort to clinical symptoms and history to aid us in making a correct physical diagnosis. So far as pulmonary diseases go it is imperative that we know both normal and morbid anatomy if we expect to make reasonably intelligent interpretations of physical findings.

A short time ago a fellow physician asked me to see one of his cases. He told me the patient was coughing up blood, that it was a lung case of some sort. So of course I went with the lung idea uppermost in my mind. The patient was an elderly man in bed in a semi-recumbent position. He was pale and thin, apparently breathing with some difficulty and frequently coughing up a mouthful of blood. He had been losing weight and strength for over a year and during the year had had at least three colds, as he said, each of which lasted about three weeks. Though the cough on these occasions was productive no blood had been raised. He had been raising blood then for two days.

I observed that the respiratory excursion was greater on his right side; also that the breath sounds were accentuated on this side. Despite the raising of so much blood, rales were conspicuously absent excepting much fine crepitation at the bases. Auscultation did not yield much to indicate any serious lung involvement. Of course pulmonary hemorrhage may arise from a very small lesion, but supposing this to have been a case of active tuberculosis of more than a year's duration we would have expected to have found more than a very small lesion. Percussion also failed to disclose any areas of relative dullness or reduced resonance excepting in the upper portion of the left chest, but this was not marked. All of the lower half of the left chest, front, side and beck, yielded a decidedly tympanitic note. This was so noticeable that I called it to the attention of those present. At once the thought of pneumothorax presented itself, but easily audible breath sounds, accompanied by fine moist râles and a negative coin test quickly dispelled this idea. The voice and whispered sounds and fremitus added nothing suggestive of pulmonary disease. Further examination disclosed a tremendously enlarged heart, with the right border extending well beyond the right side of the sternum. A double aortic murmur was clearly heard, the liver was well below the costal region and the legs were edematous to the knees. The bloody expectoration now took on a new meaning. It was undoubtedly due to a failing heart with pulmonary congestion. The diminished resonance of the upper left chest was due to the crowding of the lung by the enlarged heart. This also was responsible for the limited left chest movement. The tympanitic note in the lower half of left chest was due to a distended colon, a condition, by the way, which sometimes masks pneumonic consolidation of the left lower lobe. The accentuated normal sounds on the right were compensatory. The *x*-ray showed a normal pulmonary picture.

The next case under discussion is that of a man approaching middle life—about forty years old. He was apparently in excellent health when he became ill suddenly. He experienced a pain in his left chest, some difficulty in breathing and a feeling of weakness.

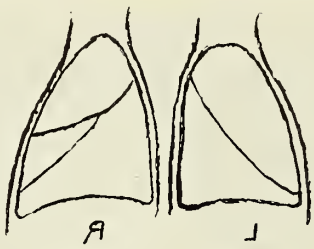
Two days later I saw this patient for the first time. He was in bed in a semi-recumbent position and apparently fairly comfortable, pulse and color good, temperature normal.

His chest was well formed and well developed. One could easily see that the excursion of the right chest was greater than that of the left. Palpation confirmed this observation and also showed tactile fremitus to be dimin-

*Read before annual meeting of the Minnesota State Medical Association, Saint Paul, May 15, 1929.

ished over the left chest and increased over the right. Percussion disclosed a distinctly tympanitic note over the lower half of the left chest. This appeared to change toward the back. With the patient sitting bent forward a seemingly dull note was brought out in the interscapular region and over the costal angles. This change was more apparent than real. It was due to the greater thickness of the chest wall in this locality. To one not skilled and experienced in physical signs this is very deceptive. It could easily lead to the conclusion mentioned in the preceding case, namely, that the tympany over the lower left chest was due to a distended colon. Close attention to the note obtained in the interscapular region revealed its tympanitic quality, made distant however by the thicker chest wall. This deceptive relative dullness together with the sharp inspiratory crackling râles present in the same region might suggest a pneumonia or even a pleuritis, were it not for the absence of fever and rapid pulse. Moreover, the breath sounds over all the tympanitic area were distant or absent (with the exception of the interscapular region). Further observation disclosed an absence of heart sounds and apex beat. The heart could not be outlined by percussion because of tympany. During inspiration the intercostal areas between the lower left ribs posteriorly were retracted. The coin test carried its ringing overtones to the auscultator. Here was an undoubted case of pneumothorax judging from the physical signs. The clinical symptoms in association with the physical findings would classify this case as one of spontaneous pneumothorax.

We find various degrees of pneumothorax in various stages of pulmonary tuberculosis. Spontaneous pneumothorax, coming out of a clear sky, occurring in a person who is in perfectly good health so far as any one knows, is in my experience not very frequent. The symptoms are peculiar. There is a sudden sense of smothering accompanied by pain. The pain manifestation is very peculiar. The patient seems to locate it about the precordium, but as he takes a deep breath it seems to shift to the lower chest and to encircle the body. Then he says he cannot tell where it is, by which I judge it to be more or less diffused. The patient's manner is one of great uneasiness and distress. The cases I have seen appear to have great difficulty in finding a comfortable position. They are very restless. I have known this restlessness to continue for upwards of twelve hours. The symptoms are simulated in some degree by artificial pneumothorax. I



Slide No. I. Lobes.

doubt not that the latter type of pneumothorax would be equally distressing, if as large an amount of air were introduced into the pleural cavity rapidly. When the patient takes a full breath, though pain and distress are accentuated, he does so without the halt and intermittance and stitch-like pain of pleurisy. This is quite to be expected for the pleural surfaces are not in contact. Only in case of pleural adhesions being pulled upon by the walls of the distended sac do we expect to find sharp and stitch-like pain.

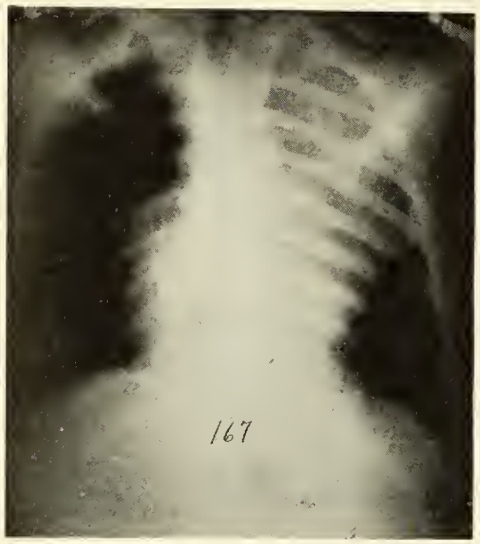
The sharp crackling râles heard in full inspiration in the case above described are easily explained. The lung is collapsed by the pneumothorax. The contraction of the diaphragm not only fills the lung on the unaffected side with air but in some degree also sucks air into the collapsed lung. The air cells of this lung are closed but dry, hence the sharp crackling as their walls snap apart. Sometimes we hear pleural friction râles quite similar to them but they are neither sustained nor regular. In a pneumonic field they change to a fine crepitation as soon as moisture appears in the air cells.

The following case is one in which the *x*-ray film was shown to me before I saw the patient. The history was of lobar pneumonia, crisis with immediate return and continuance of fever.

The film is a flat picture taken with the bedside unit. A flat picture does not afford any knowledge as to depth, and as no lateral view was at hand the position of the lesion in relation to the front or back of the chest could not

be determined without the aid of physical diagnostic methods.

The left lung is divided into an upper and a lower lobe. The upper lobe is thick above and thins out as it extends downward to end in a thin edge at the level of the sixth rib in front.



Slide No. II. Abscess.

The base of the lower lobe rests on the diaphragm. It thins out as it reaches upward to end in a thin edge behind at the level of the third thoracic vertebra. A line drawn from this vertebra around the side of the chest to the sixth rib in front will mark the line of division between the upper and lower lobes of the left lung.

Lobar pneumonia commonly involves an entire lobe. Therefore an *x*-ray shadow of a pneumonic lobe should show the outline of the lobe affected and should be of greatest density at the thickest part of the lobe. It should fade as the thin edge is approached. The intensity of the physical signs, especially those developed by percussion, palpation and auscultation, should be in conformity.

Looking at the film we perceive a shadow of uniform density extending as far down as the sixth rib in front. If it were pneumonia the shadow should show less density below unless a part of the lower lobe also were involved. Again the lower border of the shadow is quite rounded, so much so in fact as to suggest a distribution of the lesion not confined to lobe boundaries. So one thinks of pus.

Turning now to the physical findings: Percussion brought out a flat or dull note from the supraclavicular region to the third intercostal space in front. The dullness abruptly ended there and passed laterally and backward in a horizontal line across the axilla. Posteriorly the flat note in the suprascapular region extended down through the left interscapular space to the angle of the scapula. Laterally the note anterior to the posterior axillary line was resonant. The auscultatory sounds over the flat area were such as are heard in pneumonia only they were very distant. The distribution of the physical signs in this case located the lesion in the extreme upper end of and in the posterior part of the left chest. Upper-lobe pneumonia could be safely excluded. The lesion was too extensive to be a lung abscess. Its position was not in keeping with that of either lobe. The only possible diagnosis in the light of the physical findings was a circumscribed empyema in the upper and posterior part of the left pleural sac.

Some time ago while looking at some *x*-ray films of tuberculous chests I began to wonder what would be revealed by a film of those same lungs without an intervening chest wall. I wondered if the study of the films of the naked tuberculous lungs would be helpful in understanding physical signs. It is not easy to remove lungs in their entirety, at autopsy, without tearing their enveloping membrane at one or more points. As the specimens must be filled with air to make their *x*-ray pictures valuable, such an accident must not happen. One day Dr. A. G. Athens, pathologist to St. Luke's Hospital in Duluth, performed an autopsy on a tuberculous patient who had died of an intercurrent disease. With great skill he succeeded in securing for me, intact, a pair of lungs far advanced in fibrocaseous tuberculosis. I think the film gives as clear a conception of the distribution of the lesions as did the fresh gross specimen. It certainly shows why various signs should, or should not, be found during physical examination.

DISCUSSION OF FILM

Looking at the film one is impressed at once with the tremendous extent of the disease and the wealth of detail. Here we have large and multiple caseation, cavitation, fibrosis and pneumonic infiltration. Some of the small areas

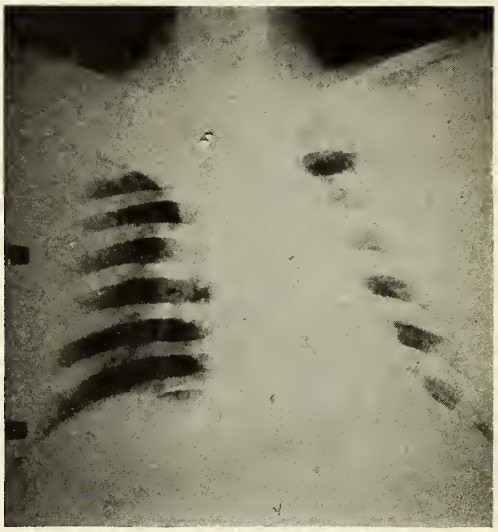
of caseation show dense borders indicating sufficient age to permit fibrotic changes. Others of them are lacking in these borders and undoubtedly represent the more recent pneumonic changes in which the reparative fibrotic process has not had time to develop.



Slide No. III. Lungs.

We may well picture in our mind's eye an emaciated patient with sunken chest walls and shallow breathing. Closer inspection would reveal lost movement in the apical regions of the chest, the reason to be clearly discerned in the large apical cavities. The cracked pot sound ought to be found in the apex of the right lung, unless the bronchi leading from it are occluded. In that case it would most likely be full of matter and dull to percussion. The dense shadow in the right lung below the great cavity is due in part to an area of greatly thickened pleura (as shown at autopsy) and in part to extensive caseation. Here the percussion note ought to be flat behind, where the pleura was thickened, and probably near flat in front. Elsewhere over both lungs there should be decidedly impaired resonance because of the extensive infiltration and caseation. Strangely enough in some of these advanced tuberculous cases the resonance seems not to be impaired, probably because of using heavy percussion. This elicits sound from a large area, so again tympany may influence the quality of the note. Light percussion should be used in these cases.

Auscultation should detect cavernous or amphoric breathing over the large cavity, perhaps distant bronchial breathing or absence of breath sounds over the thickened right pleura



Slide No. IV. Patient's Chest.

behind where it touches upon the great area of caseation. Elsewhere there might be detected many and various degrees of bronchial and broncho-vesicular breathing. It is doubtful if normal vesicular breathing could be found any place in a case so advanced as this one. And what about rales? All kinds I should think, for the tuberculous process is active, and a pus-producing mixed infection must exist in the cavities and bronchi, thus causing moisture.

The functional surface of the lungs has not yet been wholly destroyed though it is greatly encroached upon by the pneumonic process. It is in the pneumonic fields and just bordering on the areas of small caseation that the fine moist râles should be heard. These areas of small caseation, whether pneumonic or fibrotic, should yield broncho-vesicular breath sounds, *i.e.*, inspiratory sound of higher pitch than that of normal vesicular breathing with a lengthened expiratory sound. The voice and whispered sounds should be increased in proportion to the degree of consolidation and its proximity to patulous bronchi.

After seeing this film I couldn't rest until I had an opportunity to review the hospital record of the case and make comparisons. Only

that portion of the record bearing upon the pulmonary condition will be submitted.

This unhappily is not a very good film. Nevertheless it enabled the radiologist to record the following note:

"Massive bilateral pulmonary tuberculosis involving all lobes both lungs. The lesion is a mixed lesion of fibrocaseous type with more or less acute areas.

Signed by
Dr. T. G. Clement."

Observe the tremendous difference in the stories told by these two films. Even if the picture of the chest had been very superior, still the differences would be very great. The skill of the radiologist in his film reading is proven by a glance at the picture of the lungs.

Turning now to the clinical chart the following is recorded:

"Right Lung: Impaired resonance to fourth rib and sixth dorsal spine. Bronchial breathing to first and fifth dorsal spine. Medium coarse râles to third rib and seventh dorsal spine on ordinary breathing and coughing. Left Lung: Impaired resonance to fourth rib and seventh dorsal spine. Bronchial breathing to same area. Coarse râles throughout on quiet breathing and coughing."

I wonder at the paucity of findings in so rich a field. Yet we do not always easily detect all the signs above mentioned, and not without good reason. At least two factors enter into consideration. There is in this case very extensive fibrosis. Fibrosis represents lung destruction quite as certainly as does caseation. Lung destruction means reduced elasticity and shallow breathing. Shallow breathing and inelasticity permits of plugging of small bronchi. Shallow breathing fails to distend the sticky walled alveoli. Thus the near absence of inrush and egress of air results in a feebleness or absence of auscultatory sounds. Chronic pleuritis also is a factor to be reckoned with. It is always present in some degree. Its adhesions and thickenings contribute further toward obscuring the positive pulmonary signs. This explains why the signs in advanced tuberculosis are often far more in evidence in the *x*-ray than upon physical examination. I think the faintness of the physical signs is in itself a prominent and noteworthy feature in the diagnosis of pulmonary tuberculosis.

The autopsy report follows. Note how closely the *x*-ray film pictures these findings.

"Lungs: The left shows a large cavity at the apex with a capacity of 100 c.c. and four or five smaller cavities in the lower part of the upper lobe. These all contain reddish, thin pus. There are numerous small consolidated areas, which are breaking down in the center, scattered about the lung. There are several hemorrhagic areas. The right lung, likewise, has a large cavity at the apex of about 50 c.c. capacity. There are numerous consolidated areas and cavities throughout the upper lobe. There is considerable air-containing tissue in the lower lobe. The bronchi are markedly congested and contain pus. The right pleural cavity is nearly obliterated. The left pleural cavity shows many adhesions and small areas of fibrous exudate."

THE MANAGEMENT OF TUBERCULOSIS*

Part II

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THE average patient who is confronted with the diagnosis of pulmonary tuberculosis for the first time is brought to face a dilemma, of which, regardless of how he adjusts himself to the exigencies of the situation, he finds himself decorating a horn. Life has not trained him to change easily from one environmental adjustment to another. The privilege of survival has been granted to many ancestors, and finally he himself as a reward for effort and struggle. Generations of such effort and struggle have succeeded in the creation of a personality whose existence is altogether dependent upon factors that compel the individual to assert himself and to try to dominate some portion of his environment. A positive militant personality he has, and as a reward he has survival.

In the sanatorium we have attempted to provide an artificial, entirely passive, non-resistant environment, with the expectation that all personalities handicapped with the duties of presiding over the destinies of diseased bodies will adjust themselves to the environment prescribed. The difficulties encountered form the bulk of the problem in the management of tuberculosis. The cure of tuberculosis in reality becomes to a large measure a struggle between the patient and his environment. He does or eventually will feel himself physically unable to assert himself in the old environment, while towards the new one he has a strange feeling of inadequacy. The tuberculosis patient in his attempt to adjust himself does so through a series of "trials and errors," which may eventually be successful, but which in the meantime has contributed greatly to the problems underlying the management of tuberculosis.

The medical personnel can be of great assistance in aiding the patient to become a part of his new surroundings. Immediately upon entering the sanatorium the professional relationship of physician and patient must be established and carefully maintained. It does not matter whether the patient gradually passes into a domiciliary existence or rapidly becomes afebrile and convalesces towards an arrested state, the doctor must cherish and preserve that bond of confidence and respect that makes the one the physician and the other the patient.

The nursing profession nowhere contributes more to the relief of the pain and suffering of mankind than in caring for those ill with tuberculosis. To render adequate nursing service it is essential that a kindly professional bond be established and continued, the same as must exist between the patient and the doctor. The doctor and the nurse, and the social worker, must establish themselves on a professional basis with each patient as they are admitted. Break this relationship and the patient has neither doctor nor nurse; he is left alone in a scientific institution with the responsibility of the cure in his own hands. With a personality developed and trained for survival through struggle he often becomes his own worst enemy. The sanatorium can provide the best environment for the cure, but without the proper professional attitude of the staff towards the patient the sanatorium may in reality become a dangerous place for the patient to seek out as a haven to aid him towards convalescence.

With the development and maintenance of an efficient medical staff it is essential to have heads of departments who understand their own duties and the relationship they have towards the organization as a whole. The superintendent of the sanatorium must surround himself with loyal and intelligent lieutenants. Heads of departments must be capable of conducting their work with all other departments in the institution. Such a staff must not only be willing but they must show an interest and a desire to lend themselves to the labor and team work so essential to successful administration. In order that a staff may be held together, the various departments coordinated, it is essential that their duties and responsibilities be carefully defined. There are few methods more helpful to the employe in orienting himself and his duties than by the aid of diagrammatic charts.

At times the chart may require some revision,

*Concluded from last month.

but this does not occur often and serves as a guide that becomes helpful to each department. Most administrative difficulties arise where duties are not or cannot be so readily visualized.

The patient who becomes employed frequently presents difficulties to the administration; this is especially true if employment is given in the same institution where the cure was taken. He frequently has difficulty in separating himself from the cure—so much so that his value as an employe is greatly diminished. Time and application often are sacrificed because of habit, and essential work becomes neglected. Another difficulty encountered by the patient employe is in his giving loyal support to the administration and the policies of the institution. While on the cure he may not have broken rules himself and he may not have interfered in any way with the successful application of the principles of the cure, yet he belonged to a specific group, a fraternity of human beings for whom the policies were made to guide and regulations to protect. It is usually considered poor sportsmanship for patients to report on one another, for one to interfere in any way with the activities of others in his group. After months of association with other patients it becomes very difficult for the patient-employe to aid the administration when both experience and training have taught him to remain passive and quiet. Once a patient, it is very difficult for some to ever cease being one, especially so far as their contact with patients in the sanatorium is concerned. It is, however, essential that the patient-employe adjust himself to the new rôle of employe and that he forget his old rôle of patient if he is to make himself of any value to the institution which once cared for him and now pays him. The patient-employe has a difficult and important adjustment to make which he usually makes unaided and unadvised, and if he fails his employment is terminated. The incident becomes an unhappy memory, his first attempt towards rehabilitation.

The employes constitute a definite corps of individuals employed for a special purpose, which cannot be realized if associations with patients are permitted. Since employes cannot associate with patients in the interest of good treatment and good administration, patients must be allowed certain privileges amongst themselves. Associations and friendships so formed should not be given too much encouragement, since great harm may be done some patient and the purpose of the institution altogether misunderstood.

The patient must be encouraged to feel that he is an important part of the institutional program. In fact, the organization is built about his requirements of care and treatment. A chart such as we use at Ah-Gwah-Ching is of great aid in arousing the patient's interest as well as in aiding him to orient himself on the road to a cure.

Tuberculosis patients who are non-toxic and afebrile over long periods of time, but who nevertheless have considerable infiltration with positive sputum, and possibly other signs, frequently wish to break the monotony of the cure by visits away from the institution. There are few experiences more detrimental to good treatment than such visits. Such visits are often called vacations, and "vacations from the cure" they surely are. Months of time and public money are wasted within a very short time, and frequently the patient returns with extensive spreads, serious complications, to remain a bedridden case for weeks as a result of his journey.

The institutional management of tuberculosis finally resolves itself into the preparation of the patient for discharge and return to home and employment. This is the most important event that has occurred since the period of breakdown. Just how is he going to adjust himself to his new problem and who is there to aid him after leaving the sanatorium. While on the cure and convalescing in the sanatorium, has his physician prepared him for this day? Just how far will his family and associates coöperate in his readjustment to a post-sanatorium life, free of long hours, excess and strain? How well does he understand that it is not usually the job that reactivates the reclaimed tuberculous but the excesses and excitement of the social and home life that begin and end the day? How well has the sanatorium instructed the departing patient to a realization of his future physical limitations and how well has it trained him to confine his activities within such limits? One of our chief functions in the management of the tuberculous is to appraise the patient's capacity for training and to teach him the problems of rehabilitation, a problem which eventually will be his to solve. The sanatorium must be an instruction center in tuberculosis; it must advise and guide each patient separately for each has his own personal.

social, family and industrial problems to meet. Without assistance he will become beset with many difficulties and dangers. Dr. Hawes has well said:

"Those of us who are interested in stamping out tuberculosis are gradually coming to realize that no system of sanatoria, no matter how complete and elaborate as to location, number of beds, surroundings, etc., can by itself solve the tuberculosis problem. We have come to realize that the patient's stay at the sanatorium or hospital, short or long as the case may be, is but an incident in a course of treatment, the most important parts of which are before the patient enters and particularly after the patient has left the sanatorium."

"The whole question of the results of our sanatorium treatment is so intimately bound with the treatment of the patient after leaving the sanatorium—after-care work—that it is difficult, if not impossible, to tell which factor is most important, treatment in the sanatorium, or the treatment of the patient after he leaves the sanatorium."

One of the most interesting phases of the management of tuberculosis is the reaction of the patient towards the modern interpretation of the cure. Tuberculosis control and treatment is warfare in every sense of the word. Defensive warfare has never won a campaign. The modern anti-tuberculosis worker has adopted a program of aggression and offense. As long as contact and pressure is applied all along the line, positive and continuous results may be expected in favor of the aggressor. The patient entering the sanatorium was at one time expected to place himself upon a cure extending over a long period of time requiring infinite patience, without assurance or promise of end-results. Accidents and tragedies incidental to the cure could be easily ascribed to his errors of omission or commission. The patient entering the sanatorium left his hope behind or placed it in storage for possible use at some uncertain future date. Upon entering the routine of the cure, he frequently felt that a bell had been placed upon his neck, and in this mental attitude spent his rest hours and others, philosophizing over the futility of his objectives—the convalescence of a diseased body followed by the readjustment of a handicapped personality. As a result of this long, indefinite, defensive attitude, getting little else than good fellowship, could the patient do otherwise than seek essential outlets for his pent-up emotions? The sanatorium in the past has been a school of incorrigibility for many patients who, under ordinary conditions of life, would be both normal and stable so far as the emotions are concerned. The sanatorium has often failed to reach into the patient's personality and make itself his guiding star over the rocky and uncharted road leading to a maximum convalescence, and the possibilities for an approximate social and industrial readjustment. The sanatorium no longer pursues a passive policy in the care of its patients. It now offers a positive program, and in so doing it has changed a waiting, defensive battle into one of offense.

The patient is now taken into an active partnership in this organization whose chief business is the sale of the cure. He no longer is expected to accept a program of indefinite waiting for a cure to overtake him, a cure constantly chaperoned by the fear of catastrophe. Together the patient and the sanatorium make a positive and united attack upon the disease. The institution is a partner with each patient, and they work out their plans of attack together. The management of tuberculosis has, within a few years, changed from the formality of record keeping and the housing of patients, to a scientific medical service for the community who have been or will become infected or clinically ill with pulmonary tuberculosis.

COÖPERATION OF THE DENTIST WITH THE SURGEON IN A GENERAL PHYSICAL EXAMINATION*

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DURING the last decade or two, medical and dental research and practice have demonstrated conclusively that the two professions have certain interests in common. This change to a very great extent has been brought about through the appreciation of the importance of focal infection. Definite proof exists that infection of the teeth and tissues of the oral cavity contribute largely to disturbances in other parts of the body. This fact at the outset infers that the physician must broaden his field so as to include the mouth in his search for possible points of infection.

Dentistry, therefore, should be regarded as a special branch of medicine and the dentist as a specialist should be called in consultation routinely as is the roentgologist, bacteriologist, urologist, pathologist and ophthalmologist. Present day medicine tends toward closer coöperation with the dentist.

Since Billings, Rosenow, and their co-workers called attention to the oral conditions as causative factors in disease, these conditions have assumed great importance in medicine. Up to this comparatively recent date there was little knowledge in the medical profession of the part diseases of the mouth and the teeth play in the general health of the body. It was assumed that the teeth were devoid of the capacity of self repair, that dental disorders could be remedied by mechanical means alone, that all teeth, whether healthy or diseased, could be broken off or extracted without serious effect on the welfare of the body as a whole. As a result of these assumptions the profession of medicine gave little attention to the health of the teeth. But the theory of focal infection has greatly changed this condition. It has been determined through research and observation that original foci of infection are usually found in certain tissues or organs, such as the prostate, uterus, rectum, sinuses, appendix, gallbladder, teeth and tonsils, and of these undoubtedly the teeth and tonsils rank as the greatest offenders.

Now, it is not the intention of this paper to go into the subject of focal infection. I think it can quite generally be conceded that if infection in some part of the body is causing disease in some other part, the removal of the former will often result in the restoration of health. What would perhaps be of some interest would be some suggestions as to how the two professions can coöperate, what conditions in the mouth point to the possible hidden infection, and what should the M.D. expect of the dentist when he refers a patient to him for complete oral examination.

A physician, if he were to make a general inspection of the mouth, could with a good light and mouth mirror often detect conditions which he might suspect of hiding infection, such as gold crowns, which often cover dead teeth. This is the result of a belief in the dental profession some years ago that if a tooth was to be crowned the nerve should be taken out first. Peg teeth, or porcelain crowns on posts extending into the root canals (fortunately not used so much in this day) are of course always built on devitalized teeth. Dark teeth are usually dead although some years ago a silver cement was in common use for setting inlays and bridges which in time resulted in discoloration. Silver fillings also have a tendency to darken teeth. Fistulas or gum-boils always indicate infection. Pyorrhea, although apparently offensive, can often be rendered practically harmless as a source of infection with proper treatment and home care. The above conditions can be observed in a general examination. But if thorough report is desired, we must go more into detail, and for this the case should be referred to the dentist.

An oral examination by a dentist should include: (1) a survey of the soft tissues for lesions such as cancer, mucous patches, etc.; (2) examination of the gums for pyorrhea, Vincent's angina, etc.; (3) *x*-ray examination of all the teeth, preferably of fourteen films, and extra-oral plates if necessary. Many times we find swelling or edema in the region of the low third molar where only plates made extra-orally can be employed successfully. The *x*-ray

*Read at a joint meeting of District Dental Society and the West Central Medical Society at Morris, Minnesota, October 9, 1929.

will many times disclose conditions which we would not think of allowing to remain if we knew of their presence. A full-mouth *x*-ray examination has for some years been part of the routine physical examination at the Mayo Clinic. This is limited not only to patients that have teeth but also to edentulous cases. Even in the latter class records show that 31% have infected areas. Thermal and vitality tests are important because a tooth may be dead and still the *x*-ray not reveal such an existing condition. If there is no response to the vitality test there is no question but that the tooth is dead. Three years ago a man of forty-five was referred to me for oral examination. His symptoms were nervousness, restlessness, a very tired feeling and insomnia. Two abcessed teeth were found. These were extracted with resultant rapid recovery. Two months ago this man came in and asked to be examined, saying that he was suffering from the same symptoms that he had three years previously. The *x*-ray revealed no pathologic process but the vitality test disclosed one tooth that gave no response. In view of past experience in this case, it was decided to extract it and within two weeks he was back to normal. Transillumination often reveals pathologic conditions of the soft tissue that are not registered by the *x*-ray. Looseness of the teeth, discoloration, and pain deserve notice.

Although a written report on the results of the findings may be desired by the physician, perhaps the most satisfactory method would be to go over the findings together. It would perhaps be advisable not to decide on extraction of teeth until infections from other sources are first eliminated and then ask the question, is this tooth doing more harm than good systemically, as part of the organ of mastication, bearing in mind the lack of proper preparation of the food in the mouth may also have a vital effect on health.

Within the ranks of the dental profession there is a considerable difference of opinion as to when to extract pulpless teeth. Dr. Sterling V. Mead of Washington, D. C., who has devoted many years of study to oral pathology and its effect on health, says: "With very few exceptions I think the following teeth should be removed—1. All teeth showing periapical bone involvement. 2. All pulpless teeth in patients whose health is seriously endangered. 3. All pulpless teeth showing marked periodontal bone resorption. 4. All pulpless teeth bordering directly on the maxillary sinuses. 5. All third molars when pulpless or causing pressure or decay in other teeth. 6. All pulpless teeth whose root formation precludes the possibility of a good root canal filling. 7. All pulpless deciduous teeth."

In regard to pulpless teeth Dr. Gardner of the Mayo Clinic says: "Extensive bacteriologic investigations at the Mayo Clinic and elsewhere have demonstrated that even pulpless teeth which show little or no evidence of infection from the roentgenologic standpoint are usually infected. The percentage is so high that all pulpless teeth must be considered potential foci of infection and should be extracted if the condition of the patient requires the elimination of all dental infection."

Now, I do not know how many dentists and physicians in this audience are working together on physical examinations but I feel that to many of us it is somewhat of a new field. Just how successfully this work will be carried on will depend to a large extent on how we as dentists measure up when the physician refers cases to us. In making our examinations we must be thorough and in our report we must state our findings and recommendations in a definite and scientific manner, thereby becoming of such valuable assistance to him that he will feel that no diagnosis is complete without our report on the conditions of the mouth. Create in the physician a wholesome feeling of confidence in our ability as disgnosticians of the oral cavity. To do this we must have the data at our fingertips and know what we are talking about and, most important, have the courage of our convictions. I think we may rest assured that the physician will be delighted to meet us more than half way and will place his confidence in the same proportion as we have demonstrated our ability. He is only too glad to leave the dental field to the dentist, but he wants to be sure to leave it in the right hands. It is admittedly a difficult program to work out and will require tact together with constant study, ingenuity and the proper spirit. But when this coöperation is attained, we will have a feeling that dentistry has been lifted another step upward and that we rank in our profession on a par with the older profession of medicine.

THE RECOGNITION OF GLAUCOMA BY THE GENERAL PROFESSION*

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The purpose of this paper is to call your attention to the importance of the early recognition of glaucoma. When we realize that six out of every one hundred new eye cases entering an oculist's office are those of glaucoma,[23] and that glaucoma causes one-fourth to one-third of blindness past middle age,[8] we are impressed with the importance of the condition. It is, therefore, reasonable to expect that each of us, no matter what branch of medicine he is practising, will at some time come in contact with glaucoma. Whether or not it is recognized depends upon our knowledge of it and especially our knowledge of the earliest signs.

My object is, therefore, to emphasize two important factors: first, the importance of recognizing glaucoma early; and, second, the early manifestations of glaucoma.

The early recognition of glaucoma is of paramount importance because at this stage our treatment is most effective and little damage has been done to the eye, whereas, if treated when the disease is fully established, irreparable damage has been done to the eye and the operation which must be resorted to is ineffective in checking its progress. This statement is evidenced by the variety of treatments both operative and medical which are being utilized today. It is an established fact that in an eye which is glaucomatous the visual acuity is progressively lessened and will eventually end in blindness if not treated. It is also a fact that vision which is lost is never regained in spite of all our treatment. Expressions by the following authorities substantiate these statements: Fuchs,[55] one of the greatest authorities, states, "Its accurate recognition is of the greatest importance to the practitioner, the more so because here prompt and proper therapeutic interference can save everything, but a false diagnosis and improper treatment may destroy everything. Unfortunately, we still constantly get under observation many cases of glaucoma which have been incorrectly diagnosticated, and which come to the ophthalmologist only when help is no longer possible." Thomasson[16] states, "To defer a diagnosis in a case of glaucoma until obvious structural changes are present would be as inexcusable as it would be in the case of pulmonary T.B.C. to wait for obvious cavity formation and for the appearance of the tubercle bacilli in the sputum before making a diagnosis. Each disease must be diagnosed in its incipient stage if we wish to prevent irreparable damage and thus render to our patients the service they have a right to expect from us."

Hence, we see that the longer the diagnosis is delayed the more vision is permanently lost and the less our chance of checking the progress of the disease.

Glaucoma is the problem of the entire profession. In everyday practice the oculist is frequently confronted with the question—Why is it that we do not see the cases early instead of in a well advanced stage, and very frequently when the eye is totally blind? He is put in the same position as the general surgeon who is asked to cure an extremist or after the patient has expired, as a dead eye from the visual standpoint to the oculist is the same as a dead patient is to the general surgeon. In order to correct this situation so that the cases will be seen earlier we must realize the fact that recognition of glaucoma is not alone the oculist's problem but the responsibility of the entire profession, especially the general practitioner. It is he who is in a position to make the early diagnosis as the patient usually comes to him because of indefinite symptoms either directly or remotely related to the eye. He should regard every person over 40 who comes to consult him because of indefinite complaints as a possible glaucoma case until the contrary is proved. Experience has shown us that if glaucoma be constantly borne in mind a considerable number of cases may be picked up which would otherwise go unrecognized until a late stage of the disease.[10] One is often told by medical men that they have never seen a case of glaucoma and that it is so rare that they are justified in ignor-

*Presented before the Asbury Hospital Staff, Minneapolis, February, 1929.

ing it. This is a fallacy, for at least one patient with glaucoma presents himself to the general practitioner every few years.

It is not necessary that the physician be highly trained in ocular diagnosis to recognize glaucoma. There are some cases extremely difficult to diagnose but in most instances there is evidence enough to cause him to suspect its presence. The following statement by Wilder[7] is significant: "Ignorance in regard to this dreaded condition should not exist. General physicians should be impressed with the importance of the early recognition of it, and although they may do no ophthalmic work should be able to recognize it, or at least in more insidious cases to suspect it. Errors of recognition are not necessarily due to ignorance, but may result from oversight because of multifarious duties the general practitioner must assume." As stated by Derby,[8] "Glaucoma is the one important cause of loss of vision in which no concerted effort at conservation has been made. The physician who passes his eye cases over with a hasty inspection, or who allows himself to be beguiled into the practice of prescribing eye washes for all eye disorder, will, sooner or later, make some error fatal to vision which might have been avoided."

It is only through the coöperation with other branches of the profession that the oculist can hope to obtain glaucoma in the incipient stage.

The second point I wish to emphasize is that the early signs of glaucoma are definite. If this is so, why is it glaucoma is not recognized early? This, in my opinion, is due to the fact we are not entirely familiar with its early manifestations, and consequently the condition is overlooked. Most of our schools in teaching this subject dwell at length upon the fully developed and advanced stages of the disease and as a result our conception of the symptoms of glaucoma are those of the well established glaucoma. Very little is said about the early signs and therefore we think of the condition only when it has passed into the well established period. It is very evident that if we are to make any progress in the prevention of glaucoma it must be made along the lines of early recognition. This thought is well expressed by Batten,[2] who says, "Our knowledge of the premonitory symptoms of glaucoma is very limited, and has not received the attention the subject deserves."

In order to obtain a clearer picture of the earliest manifestations of glaucoma, I wish to present the following cases. Each case has a characteristic onset and illustrates some of the ways glaucoma in its earliest stages makes its presence known. In presenting these cases certain phases have been purposely omitted for the sake of conciseness, and only the essential features relating to the onset are considered. Therefore, no attempt will be made to discuss the cases completely as the omitted features have no bearing on the present discussion.

Case 1.—

History: Miss E. G., aged 55, had been known all her life as a "high strung and nervous" person. For 12 years previous to her present illness she had been under medical care because of high blood pressure. She was easily upset and tired very readily. Glasses had been worn constantly for years for a high hyperopic error. Last refraction was done six years previously. Recently, because of financial reverses, she had been forced to work for her living. The work necessitated the prolonged use of her eyes and expenditure of much nervous energy. She returned home at night exhausted. One evening after a strenuous day she noticed a dull ache in the right eye. This became progressively more pronounced and she was forced to call for relief. Ophthalmoscopic examination showed well advanced atrophy and cupping of the nerves of both eyes. On questioning, it was determined that her mother had glaucoma. A diagnosis of acute congestive glaucoma was made.

This case presents a number of features which should make us at once suspicious of a glaucomatous tendency and should focus our attention on the eyes. All treatment and attention had been given to her general medical condition and the eye disregarded. The result was a hopeless case of well advanced glaucoma. The features which are significant are:

Age: In this case the age was 55, which is the age at which glaucoma is most frequently seen. It is a common observation that most cases of glaucoma occur in middle and late life, and statistics confirm this. "It is not an unwise policy to be suspicious of every eye patient 40 years of age or older, until by careful study we can declare such a patient free from glaucoma." (Peter[23]).

Sex: In this case the patient was a female. Although many cases are seen in males, most authorities agree that it is more commonly found in females.

Inherited tendency: If a family history of glaucoma is present we should be on our guard as there is a decided familial tendency. Familial

glaucoma, according to Lamford, is continuous in descent and is transmitted by both sexes.

Refractive error: The patient was highly hyperopic. It is generally accepted that to patients who have a high degree of hyperopia, we are justified in recommending periodic observation, and to report the appearance of any suspicious symptoms of glaucoma. In general it should always be borne in mind that hyperopes with small short eyes are chiefly the subjects of such tendency.

Vascular changes: The patient exhibited a hypertension. Arteriosclerosis is frequently present and the blood pressure is usually elevated. The study of clinical material teaches that the individual suffering from glaucoma in 90% of the cases is not alone suffering from his eyes, since he is also suffering from a general vascular affection. Charlin had studied the cardiovascular condition in 100 patients suffering from primary glaucoma, of whom 90 presented evidence of vascular disease.

Nervous instability: Glaucoma occurs mostly in people who are of a more or less neurotic temperament and who are under a great mental strain. It is commonly observed that grief, anxiety, and worry act as exciting causes of attacks of glaucoma. Hamberger considers glaucoma essentially an expression of some such irritating influence from the central nervous system. Bilger regards it purely as a vaso-neurosis, comparable with migraine.

General medical condition: There is no disease of the eye in which it is more important to take a careful account of the general physical condition and health of the patient than in glaucoma. Probably the more we learn about ocular disease the more widely will we perceive its relation to the general condition. La Grange in his latest book says that glaucoma is generally not a local disease but an ocular condition occurring in an already diseased organism. Glaucoma rarely occurs in individuals in good general health.

Case 2.—

History: Mrs. H. A. G., aged 60, had noticed for the past two years that her eyes tired very easily and because of this early fatigue she had consulted her oculist several times. Each time the reading glass was strengthened and for a time following each change was relieved. As the relief was not permanent she decided to try another doctor.

Examination revealed nothing suggestive in the external examination and the vision was normal. Perimetric study showed a marked contraction of the visual fields, leaving only the central vision intact. Ophthalmoscopic examination showed a typical glaucomatous cup in both nerves. Other tests substantiated the diagnosis of chronic noncongestive glaucoma of long standing.

This case shows how insidious the onset of glaucoma may be. The only symptom which should have aroused suspicion was the ocular fatigue. It is also important to note that the central vision was normal even though the peripheral vision was gone. The measurement of central vision is of no value as a gauge of the progress of glaucoma until the disease has reached a late stage. Fuchs[55] states, "The diminution of the central vision often develops late, when the field of vision has already become very small, so that patients may carry on fine work while they are scarcely able to go about any longer. The patient often does not become aware of the existence of the disease until late." The patient's eyes tire very easily, and, thinking it is only a question of procuring stronger reading glasses, he goes to the optician and finds that he gets on much better with the new lenses, but after a time again finds increasing difficulty in reading, especially at night. This is to be regarded as a very dangerous and characteristic symptom in a person past middle age. Therefore, frequent changes of glasses, especially rapid changing of near vision or premature reading glass, should arouse our suspicion. Roemer[54] states, "Unusually rapid recession of the near point is noticed long before other signs of glaucoma become manifested." Priestly Smith states, "When patients between fifty and sixty years of age desire to change their reading glasses frequently or to use one stronger than is suited for their age there is reason to apprehend the onset of glaucoma." These patients often put the matter off indefinitely with the entirely satisfactory explanation to themselves that it is due to a little overuse of their eyes, and that a good night's sleep will straighten them out.

Case 3.—

History: H. J. L., aged 55, had noticed for the past year that his vision was foggy at times. Two months ago he noticed that he could not see so well with the left eye. Since this time it has progressed and recently he has noticed that the vision in the right eye was less. Being alarmed, he consulted his doctor and was told that the condition was cataract but was too early for operation. He was advised to return in six months for a check up. Being dissatisfied with this advice he decided to get an oculist's opinion.

Examination: Externally the eye was normal. Ophthalmoscopic examination showed no evidence of cataract but a definite early cupping of the disc was seen. A moderate degree of ocular hypertension was present. The diagnosis of chronic noncongestive glaucoma was made.

This case is another example of how chronic simple glaucoma is manifested. Visual failure may be the only symptom and is frequently observed for a long period before the other signs of glaucoma become manifest. Dimness of vision or foggy vision may also be noted. In describing their symptoms some patients speak of cloudiness of vision, some of seeing through a smoke, while others state that there is a fog in the atmosphere. Some patients complain that these mists are very bad in the early morning and gradually pass away as the day goes on. Others have them later in the day and attacks synchronized with periods of fatigue; but food, rest, or diversion relieve them. Very frequently this reduction in vision suggests cataract formation to the physician, and experience shows that patients have been advised that cataracts are forming and to report at a later date to the oculist for operation. This grave error can be easily avoided by the use of the ophthalmoscope which shows the lens to be clear. The following statement by de Schweinitz[56] is significant: "It is an inexcusable error to confound the failing vision of chronic glaucoma with cataract. Eyes have been permitted to pass into blindness and their possessors deluded with the hope that they are waiting for the ripening of a cataract." The history of gradual painless loss of vision combined with the increased density of the lens in old age, giving a slightly yellowish reflex when light is thrown in the pupil, quite naturally suggests the condition of cataract. Chronic simple glaucoma is not simple to diagnose. The tension is often not much increased, requiring a tonometer to detect the increase. The pupil is often normal in size, there is no congestion and, most misleading of all to the man who thinks of glaucoma only as acute glaucoma, there is no pain. The history is usually exactly like that of cataract—a gradual decrease in vision usually affecting one eye first and then the other. If no opacity is seen, it is practically certain that some other condition than cataract is present, and this is quite likely to be chronic simple glaucoma which requires very prompt and careful treatment if any of the little sight that remains is to be saved.

Case 4.—

History: H. L. P., aged 45, had noticed for the past six months that his eyes have been slightly inflamed, more pronounced at times. Whenever the eyes were more inflamed there was a slight dull pain in the region of the eyes. His vision had not changed. It was impossible for him to use his eyes for close work because of the early fatigue and discomfort which followed. Ordinary daylight would cause discomfort. During the attacks of more pronounced congestion he could see rainbow rings around electric lights or had a misty vision. This would pass off in a short time.

Examination: The deep vessels of the globe surrounding the cornea were larger than normal. The anterior chamber was shallow and the pupils partially dilated. Their reactions were sluggish. Ophthalmoscopic examination showed a normal colored nerve head with a deep cup which did not extend to the edge of the disc and no bending of the vessels as seen in glaucoma. A venous pulsation was visible at the edge of the cup. Tension was normal at the time of the examination, but when followed for a period of several days, showed a typical glaucoma curve. Adrenalin was instilled and caused the tension to increase slightly. Perimetry studies showed a slight enlargement of the blind spot towards the macula. A diagnosis of subacute congestive glaucoma was made.

There are several features of the case which are characteristic of early glaucoma. Halos or rainbow rings around lights is a very suggestive sympton. They are usually associated with foggy vision. Mists and halos are often the earliest evidence of the disease which attracts the patient's attention and are a very delicate symptom of a rise in intra-ocular pressure. In the early stages of the disease, these phenomena are transient and rapidly come and go; but later on they assume a more permanent character. It is not uncommon to meet with glaucoma patients whose complaint is that from time to time they have seen colored rings around lights, and in whom no other evidence of glaucoma can be elicited by even the most careful examination. Most frequently we get a history of the rings appearing for short periods, when the patient is tired, and passing away when he gets a meal and rest.

Another important feature of this case was the shallow anterior chamber. This condition when present should put us on our guard. It may be a physiological condition, but it is generally admitted that when the anterior chamber is shallow an investigation is called for, especially if associated with a congested eye. Shallowing of the

anterior chamber is the most constant of the signs of glaucoma visible on simple inspection. It is due in most instances to the forward displacement of the lens. A fairly deep anterior chamber does not preclude the existence of glaucoma. A shallow chamber, on the other hand, furnishes a suspicious link in the chain of evidence which may be gathered when symptoms are carefully analyzed.

Pupillary changes likewise are important to note. A shallow chamber with a small tight pupil is the usual finding in middle aged people. But when such shallow chamber is associated with a pupil of 4 mm. or larger that reacts but little to light or accommodation in people of that age, it should immediately arrest our attention. It is important to note that in eyes suffering from, or predisposed to, glaucoma the instillation of a drop of eserine lowers the intraocular tension, while a drop of homatropine raises it. This does not occur in normal eyes and is a fact of some use in cases of doubtful diagnosis. Also, in the normal eye the instillation of adrenalin has no effect on the pupil, but there is no doubt that the Knapp adrenalin mydriasis test is positive in a very large majority of glaucoma patients. While discussing pupillary changes, it may be of interest to mention a recent observation made by Koeppe. He has claimed that glaucoma can be recognized even in what he terms the "preglaucomatous stage," by the aid of the Gullstrand slit lamp, months or a vear before any other sign of the disease has appeared. He states that as a result of the morbid changes, which are taking place, pigment granules are set free; and that these wander out in the form of a fine dust, and are to be seen on the surface of the iris stroma. The observation has been both supported and contradicted. Another recent observation which is closely associated with the above discussion is the work of Uribe Troncoso. He has devised an instrument, the gonioscope, for examination of the angle of the anterior chamber. A disposition to glaucoma is often indicated from the angle of the anterior chamber and the presence of synechia. Often in early glaucoma one can find brown or black pigment spots of pigment epithelium origin in the region of Schlemm's canal.

Perimetric examination of the above case showed a characteristic finding of early glaucoma, namely, enlargement of the blind spot towards the macula. Examination of the visual field, when suitably conducted, furnishes the most delicate and the most reliable indication of the early pressure of incipient glaucoma. The earliest changes appear within an area of 26 degrees of the center of vision. They are best determined by working at a distance of one meter on a special perimeter called the scotometer. According to Thomasson[16] this test is "probably the most important aid to the diagnosis of glaucoma at our command. It enables us to discover an almost infallible sign of this disease long before any subjective symptoms are constantly present." Elliot also considered it the most important procedure of all. By this method certain changes are mapped out which, although not absolutely pathognomonic, are considered very reliable evidence of the presence of glaucoma.

The optic nerve change in the above case brings up a very important point. The disc was normal in color and had a physiological cup. Beginning glaucoma may be present with a disc which has a so-called physiological cup. The physiological cup is described as a partial cupping not deeper than the lamina cribrosa, and not extending to the disc margin; also, the vessels do not emerge sharply at the margin of the disc. We must not feel that a disc having a physiological cup is free from glaucoma. Experience has shown us that a deep physiological cup may later progress into a true glaucoma cup. It is well to regard large excavated cups, especially those approaching very nearly to the temporal margin of the disc, with suspicion.

There are other changes in the disc which appear early, and are considered by good authorities to be significant, and which can be depended upon as an indication of incipient glaucoma. When a depression of the disc, however shallow, shows abruptly at the disc margin and the vessels bend sharply as they cross the margin, we have a definite sign. It is also suggested when the disc surface shows a decided slope from the cup margin to the disc margin. Hyperemia of the optic nerve or edema of the nerve head may precede the cupping. Pallor of the disc is seen occasionally very early. The optic nerve changes as an aid to early diagnosis of glaucoma, so far as the characteristic cupping is concerned, are not of much value, because by that time the disease has become firmly es-

tablished and has existed for some time. We must recognize the condition while the nerve head is a healthy pink and before atrophy has taken place. Recognition of the disease at this stage is of vital importance.

A venous or arterial pulsation at the edge of the disc should arouse our suspicion. In most normal eyes a slight venous pulse can be distinguished, and if the pressure within the eye rises, one of the first results is an accentuation of this venous pulse. If a further rise in pressure takes place, pulsation is communicated to the arteries as well as to the viens, and may become a very marked feature of the ophthalmoscopic picture.

The measurement of intra-ocular tension as an aid to the early diagnosis of glaucoma is of value especially when the other symptoms are doubtful. Hypertension of low degree can exist for a long time without other symptoms. It is therefore important that this be looked for in making an early diagnosis. Measurements obtained by the use of the tonometer will show slight variation from the normal. The old method of finger tonometry is only of value as a preliminary test and then only when there is considerable variation either too high or too low. But for certain limits it is valueless and may be misleading. An important point to emphasize is that a single reading is of no value unless there is a marked variation from normal, but when the change is not pronounced or normal, a series of measurements is necessary and should be recorded like a temperature chart. It is important to know that the tension should not differ materially between the two eyes and a tension which is normal in one man's eye may be pathological in the eye of another. A low tension may be measured in an eye but may be pathological for it, and so also a slightly higher than normal tension may be normal for another eye. The tension may be within normal limits in many cases of definite glaucoma. If this is so, how are we to determine when the tension is pathological? This is determined by the daily pressure curve which is typical of glaucoma. There is evidence to show that the normal eye varies but little during the day, whereas the glaucoma there is a typical variation. It is maximum in morning and minimum in the afternoon. According to Hagen[33] the pressure curve is a means by which diagnosis is made earlier than by any other method. The whole curve may be below normal tension or normal all the time, yet the pressure curve show glaucoma present.

Variation in tension on dark adaptation is important in early diagnosis. Frigenbaum has shown that in a dark room, an eye with glaucoma rises in tension over 6 mm. of mercury, whereas in the normal eye a slight change is noted over a longer period.

The effect of massage on the glaucomatous eye is of practical value in diagnosis. It has been observed that massage which would lower the tension of a normal eye appreciably has comparatively little effect upon a glaucomatous eye. According to Thebert this reaction is important in early diagnosis.

It may be of interest to mention a test which, although in the experimental stages, will eventually prove to be of value in the early diagnosis of glaucoma. This is the alteration in light sense. There is good reason to believe that a slight failure in light sense is one of the earliest indications of the onset of glaucoma. In cases of incipient glaucoma it is believed a rise in light minimum curve is often the earliest sign. It has been demonstrated that after glaucoma has developed in one eye only, the second eye, although entirely free from glaucoma so far as usual signs and symptoms are concerned, may foretell its own development of the same disease by showing changes in the light sense, a slowing of dark adaptation, and an increase in the light minimum.

Another test which may prove to be valuable is the increased permeability of the capillaries, a diagnostic sign of glaucoma which has been suggested by Thiel. Sodium fluorescein is given the patient by mouth, and its appearance is looked for in the aqueous humor by means of the slit-lamp. In the normal eye it is not detected, but in iritis and glaucoma this writer claims that a fluorescence is visible in the pupil. Although this work is new, it suggests the possibility of a valuable procedure.

Case 5.—

History: Mrs. J. B., aged 65, stated that for the past two years she had noticed that her vision was "failing." This was more noticeable at times, and during these periods the vision was so greatly reduced that things looked foggy. On one occasion she was totally blind for a few minutes. During these attacks of reduced vision she noticed colored rings around electric bulbs. At times a dull ache was present in and about her eyes and the eyeballs were congested. Between

attacks her eyes felt almost normal except for early fatigue. She has been under a doctor's care for the past two years because of high blood pressure. The day previous to consulting me she had a severe headache which was centered around the right eye. This became progressively worse and she was confined to bed. She became nauseated and vomited. The vision rapidly diminished and in a few hours she could not see with the eye. Morphine did not relieve the pain.

Examination: The eye was greatly congested. The lids were swollen and the conjunctiva of the globe was chemotic and bluish in appearance (due to venous engorgement). The cornea was hazy and the anterior chamber obliterated. The pupil was irregularly dilated and did not respond to stimulation. A greenish reflex was present from the pupil, and a view of the fundus was impossible. The tension was stony hard, but was relieved by constricting the pupil with eserine. This caused the symptoms to rapidly subside. A later examination showed a marked cupping of the disc, typical of glaucoma. The vision was practically nil. The other eye showed a similar involvement but to a less degree. A diagnosis of acute congestive glaucoma was made.

This case brings up the question of differential diagnosis. Inflammation in an eye should be carefully examined before it is prescribed for and a differential diagnosis made. We should have in mind three important eye diseases in every inflamed eye we examine: conjunctivitis, iritis, and inflammatory glaucoma. No treatment whatever should be given unless we feel sure of our differential diagnosis, for the treatment of these three diseases is radically different. The treatment that will cure one will render the eye blind in the other. A simple differentiation is made by observing the following points.

Congestion: Conjunctivities presents large blood vessels superficially located in the covering of the eyeball itself. These vessels are smallest at the cornea and grow larger and more tortuous as they reach the fold or the cul-de-sac. In acute glaucoma the eye assumes a purplish hue on account of the venous stasis. In acute iritis there is more of a diffused pink color surrounding the limbus and extending over the globe.

Pain: In many cases of iritis the pain is just as severe and these cases are much more common than those of acute glaucoma, a relatively rare disease. However, the pain is much more acute in its character, much more rapid in its development and much more extensive in its distribution in acute congestive glaucoma. It is frequently mistaken for a severe neuralgia.

Discharge: This is usually present in a conjunctivitis and absent in iritis and glaucoma.

Age: Conjunctivitis is common at all ages. Glaucoma seldom occurs before the fortieth year, and iritis is rarely seen in childhood.

Tension: In acute glaucoma a careful palpation through the closed lids will often show a marked hardness of the affected eye as compared with the other eye. In iritis, however, where the lids were swollen and the eye is exquisitely sensitive, it is often impossible to press on it hard enough to tell whether it is hard or soft. The tension is increased in glaucoma and normal or even decreased in iritis.

Pupil: The pupil in both cases is relatively immobile, but is especially so in acute glaucoma, and in this condition is widely dilated, while in acute iritis the pupil is inactive but contracted, unless a mydriatic has been used, in which case the iris will show adhesions to the anterior capsule of the lens, giving an irregular outline to the margins of the pupils.

Anterior chamber: The iris is pushed forward in glaucoma, due to the intra-ocular pressure, producing a shallow anterior chamber; in iritis the anterior chamber is normal in depth, or if changed is deeper than normal.

Case 5 also brings up the question of ocular pain, which in this instance was severe. Aside from the visual changes in glaucoma, perhaps pain is the principal symptom that causes the patient to come to his physician for relief. The neuralgic pains of glaucoma may vary from a peculiar sense of discomfort to a severe pain of characteristic nature. Marked pain does not occur early in simple glaucoma, but slightly aching or asthenopic discomfort may be the first symptom. A simple glaucoma may run its whole course without one moment of pain in the eye. Again, the early slight attacks of subacute glaucoma may be attended only by mild feelings of discomfort or of ocular pressure. On the other hand, the acute disease is marked by great suffering. The trouble is not always referred to the eye. The patient and even his medical advisor may make the mistake of thinking that the cause of the trouble is in the teeth, the ears, or nose, since the "neuralgia" complained of appears to start from one of these organs.

The headaches, which make us suspicious of glaucoma, are headaches in people past middle age when all refractive errors have been cor-

rected; or headaches in elderly patients associated with vomiting.

CONCLUSIONS

Our greatest hope in arresting glaucoma lies in its early recognition because at this time its response to treatment is most satisfactory. Glaucoma is the problem of the entire profession and it is only through the coöperation of all branches of the profession that we can hope to obtain glaucoma at an early stage.

Glaucoma can be recognized in its earliest stage if we are on the lookout for it and are familiar with its early manifestations. The five cases presented emphasize some of these. Case No. 1 brings out the importance of predisposing factors. Case No. 2 shows how insidious the onset of glaucoma may be, there being no external changes or loss of vision. The only symptom was early ocular fatigue. It also shows how the reading vision may be perfect and the eye practically blind. Case 3 illustrates how visual failure may cause us to consider cataract formation and the eye slowly pass into blindness while waiting for the cataract to mature. Case 4 emphasizes several points of importance: the diagnostic value of halo vision, anterior chamber, pupillary, optic nerve and tension changes. It also shows the value of the perimeter as a means of diagnosis. Case 5 emphasizes the importance of distinguishing between acute conjunctivitis, iritis, and acute glaucoma.

Although certain cases require extensive equipment and much detailed study before a diagnosis of glaucoma can be made, the great percentage of cases can be diagnosed or at least suspected by much less study and without the aid of special equipment. The essential point to remember is that its early recognition means everything and that it is not a rare mysterious disease which interests only the oculist, but rather a fairly common condition which we all see and which we can all recognize if we are on the lookout and know its symptoms.

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MUTATION OF STREPTOCOCCI: REPORT OF A PROBABLE CASE*

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Rosenow[3,4] (1913 to 1915) reported studies on the transmutation of streptococci and pneumococci. He demonstrated that hemolytic streptococci could be changed to streptococci of the viridans or mucosus varieties, and these, in turn, into pneumococci. The process also could be reversed. All this seemed dependent on the selection of suitable strains and appropriate methods of culturing, and, among the latter, gradients of oxygen tension apparently played an important part.

The transformation of some of the strains was found to be complete by every test known. This was proved by morphology, the presence of capsule, the fermentative powers, the solubility or insolubility in bile and in solution of sodium chloride, the behavior toward the respective broth cultures, the specific immunity as manifested by the production of opsonins and by agglutination with antipneumococcus and antistreptococcus serums and the pathogenic powers. Moreover, when the transformation was complete, the acquired properties became fixed, and the strains then behaved as did those obtained from the usual sources. To change the organisms again it was necessary to place them under stress or strain. The underlying conditions which called forth changes were favorable conditions for luxuriant growth and subsequent unfavorable conditions. New or latent energies which were previously not manifest were called forth and tended to persist. There was no question about working with mixed cultures because of each main variety of organism single organisms were obtained and so the changes observed were not due to so-called "mass selection" but to actual changes under the influence of changed environment. If such a condition could prevail under artificial growth it seemed feasible that it would also occur in vivo. Rosenow[2] observed apparent mutations in animals and almost exclusively in closed cavities, such as the joints, the pericardium, and in the pleural cavity in patients recovering from pneumonia caused by the pneumococcus. These mutations took place mostly when the tissues of the host were getting the upper hand and the organisms were being destroyed. He spoke of mutations in vitro as "retrogressive" and those in animals as "progressive" because, in the former, virulence, fermentative powers, and other evidences of a vigorous vegetative life were diminished; in the latter they were usually increased.

The bearing that these observations might have on organisms in distant foci of infection seems apparent. Foci of infection might be places through which bacteria not only gained entrance to the human body but also places where conditions are favorable for them to acquire the properties which give them affinities for various structures.

That these observations of Rosenow have a practical application is strongly suggested by some types of disease in which foci seem to play a part in the progress of the infection. Undoubtedly, many similar instances could be cited, but the case here reported illustrates numerous features supporting the hypothesis of mutation of streptococci. If there still remains disapproval of the term "mutation," there can be no possible objection to the term "dissociation," as used by Hadly to designate the close relationship of various streptococci and the probable ability of them to change from one to the other as they pass through various phases of perhaps a life cycle.

REPORT OF CASE

A married woman, aged twenty-five years, came to the clinic, September 10, 1928, with a history of intermittent bloody dysentery of five years' duration. The first attack had begun about five years before with frequent movements of the bowel, between ten and twelve in twenty-four hours at the maximum. The attack had subsided in a month. After a remission of several months, the trouble had recurred. The second time it had been more severe and the number of stools had averaged ten to twenty-five in each twenty-four hours and had contained much blood, mucus and pus.

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Central Society for Clinical Research, Chicago, Illinois, November 22, 1929.

This attack had lasted through the summer and until fall, when her condition had become somewhat improved under local irrigations and limitation of diet. Since then there had been improvement each winter and an exacerbation each summer. The patient never had been entirely free from symptoms since the first attack. The last attack had begun about six months before she came to the clinic and had become progressively worse until her admission. In the course of this time she had lost about 30 pounds in weight.



Fig. 1. Colon after barium enema of patient with extensive subacute ulcerative colitis.

On admission the patient's weight was 82.5 pounds. Her blood pressures were 115 systolic and 70 diastolic, her pulse rate was 94 beats for each minute and her temperature 98.4° F. Her tongue was thickly coated. She seemed fairly well nourished but was of rather slight stature. There was generalized abdominal soreness, seemingly more marked along the line of the colon. The anal sphincter was very spastic and the rectum imparted a granular feeling to the finger. At no time during her stay in the hospital was anemia very marked; the lowest estimate of hemoglobin was 65 per cent by the Dare method and the erythrocyte count was 3,310,000 for each cubic millimeter. There was persistent, mild leukocytosis, ranging between 8,800 and 14,100 cells for each cubic millimeter. Urinalysis gave essentially negative results. The Wassermann reaction of the blood was negative. Early in the disease there was a report of someone having found amebæ, but at this time repeated examinations of stool failed to reveal parasites, ova or acid-fast bacilli. The roentgenogram of the thorax gave negative results. The roentgenologic examination of the colon showed evidence of chronic ulcerative colitis of the entire colon with deep ulceration (Fig. 1). Proctoscopic examination was done, September 11. The mucosa of the rectum and sigmoid was glazed and bled with slight trauma. There was extensive secondary ulceration; the lumen was contracted to about half its usual diameter. Activity of the disease was graded 2, and the diagnosis was chronic ulcerative colitis. The diplostreptococcus so commonly found in these cases was isolated from the ulcers in the rectum. Other laboratory data were of no diagnostic importance at this time.



Fig. 2. Streptococci in long chains isolated by blood culture.

Treatment with specific immune serum was begun. At this time the patient was having between twelve and fifteen rectal discharges, mixed with blood and pus, every twenty-four hours. Improvement was striking until September 25, when she had a general feeling of malaise, a slight chill and an elevation of temperature to a maximum of 103.5° F. The maximal temperature prior to this, in the two weeks she had been in the hospital, had been 101° F. There was marked tenderness over the descending colon and sigmoid, and the question of perforation was considered. Palliative measures were applied and within forty-eight hours the condition subsided. Improvement again continued until October 10, when an acute, periapical dental abscess developed, and, coincident with this, occurred the first symptoms of arthritis. The arthritis progressed rapidly, and in four days many of the joints, including the fingers, ankles, knees and elbows, were acutely tender and swollen. In the lower jaw was a typical "gum boil," which was tender and sore. By October 23 this had subsided sufficiently to allow of removal of

the offending tooth, and following its removal the arthritis subsided promptly. During the weeks of the arthritic difficulty, the colitis remained at a standstill. Large doses of the salicylates were employed in the treatment of the arthritis.

October 25, numerous red, elevated, tender nodules appeared in the subcutaneous tissues of the lower extremities, and two on the right arm. Associated with this occurred a rise in temperature to 102.5° F. In consultation with a dermatologist, a diagnosis of erythema nodosum was made. With the subsidence of the arthritis, the nodules subsided, and also the colitis, so that, by October 31, the patient was having two formed stools daily. At this time, and on several previous examinations, cardiac involvement had not been noted.

December 4, tonsillectomy was performed, and in the tonsillar abscesses discrete diplococci and short chains of diplococci were found and were injected intravenously into rabbits. Acute polyarthritis and acute ulcerative colitis developed in the rabbits. The discrete diplococcus found in the tonsillar abscesses corresponded in appearance to that of the organism which had been obtained from the rectal lesions, as it appeared when freshly isolated. The patient made a fairly uneventful postoperative convalescence, but within seven days after tonsillectomy an acute exacerbation of the polyarthritis occurred, with tender, swollen joints; however, there was only a slight exacerbation of the colitis in the form of an increase in the number of stools to four and five in twenty-four hours. The stools were streaked slightly with blood. Under heavy doses of salicylates the swelling in the joints subsided somewhat and the administration of specific ulcerative colitis serum was again begun.

December 14, after several days during which the patient had not felt particularly well, there was a rise in temperature to 102° F. At this time, on blood culture, an indifferent type of streptococcus, in short chains, was obtained (Fig. 2). When these organisms were injected into rabbits, lesions developed in the joints. This general upset lasted only three days, following which came two weeks of marked improvement, until January 3, when a sudden chill, and a temperature of 105.5° F. developed. Blood culture at this time resulted in growth of a diplostreptococcus, morphologically much larger than the first organism obtained on blood culture and resembling more the organisms of chronic ulcerative colitis. Intravenous injection of this organism into rabbits again was followed by lesions of the joints, but also by hemorrhages into the mucous membrane of the colon. Treatment with specific serum was continued, and improvement was progressive, so that by February 1 the patient was dismissed from observation. She was averaging four bowel movements in twenty-four hours, without admixture with blood, the arthritis and the erythema nodosum had subsided completely and she was directed to continue administration of the specific vaccine at home. In a recent letter she stated that improvement has continued.



Fig. 3. Large lanceolate diplococci within chains of smaller streptococci seen in smears from blood culture.



Fig. 4. Diplococci seen in smears from blood culture, after several subcultures in glucose brain broth. The predominating organisms here are streptococci in short chains.

COMMENT

The interesting features in the bacteriology in this case are the following: An organism like the

diplostreptococcus that was isolated from the ulcers in the rectum was isolated also from the abscesses in the tonsils. Two dissimilar organisms, both of the streptococcus group, were isolated by blood culture. The culture made from the dental abscess became contaminated, but clinical symptoms suggested relationship between this organism and that causing the arthritis. Repeated subculture of the organism isolated from the blood stream resulted in the isolation of an organism in all essentials like the organism of ulcerative colitis and also like streptococcus in short chains. In the same culture tube would appear short chains of rounded streptococci, with pairs of diplococci in the chain (Figs. 3 and 4). When the organism isolated from the blood was injected intravenously, lesions of the joints and of the colon developed. A striking feature is the isolation of similar organisms from the blood, from the abscesses of tonsils and from the ulcers in the rectum, and the temporary exacerbation of the various clinical conditions when the foci were eradicated.

One might speculate extensively about this human laboratory. The facts suggest many possibilities. The relationship of severe subacute ulcerative colitis, polyarthritis, and erythema nodosum has been described previously.[1] The opportunity of following these conditions through the various phases rarely presents itself. Information along these lines is usually gleaned from the history. This, and the bacteriologic data that accompanied each new development, must be taken seriously and applied, perhaps, in a consideration of disease on which distant foci may have a bearing.

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GASTROINTESTINAL SYMPTOMS OCCURRING WITH UPPER RESPIRATORY INFECTIONS IN INFANCY AND CHILDHOOD*

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GASTROINTESTINAL symptoms are so often present in children having acute upper respiratory infections that it seems worth while to discuss them briefly. Often the intestinal symptoms are much more outstanding than those of the respiratory tract, so much so that one is apt to make a mistake in diagnosis unless on his guard. The intestinal symptoms frequently are so outstanding that they are the reason for calling the physician and it is only when a complete physical examination is made that the real cause of the trouble is found. It is to emphasize the necessity of making a thorough and complete examination that I wish to discuss the various intestinal symptoms which may occur with upper respiratory infections.

Any of the acute upper respiratory infections, from a simple head cold to the severest forms of influenza or pneumonia, may be accompanied by intestinal symptoms varying from those of a mild degree up to those of an alarming nature. In this paper we shall include under the term "acute upper respiratory infections," simple head colds, tonsillitis, pharyngitis, laryngitis, bronchitis, la grippe, influenza and pneumonia.

The intestinal symptoms which may accompany any one of these infections are varied. We often see any of the following: anorexia, vomiting, diarrhea, constipation, flatulence, acute abdominal pain, mucus in the stool, abdominal tenderness or tenesmus. Finkelstein and Czerny called attention to the prevalence of intestinal disturbance caused by parenteral infections, but I think that many of us fail to recognize how very frequently these disturbances occur and how severe the intestinal manifestations may be.

It is not my intention to discuss in this paper intestinal intoxication or decomposition (athrepsia) even though both of these conditions often result directly from acute upper respiratory infections. It would be impossible to adequately handle these conditions in a paper of this kind. Instead, the discussion will be limited to the type of intestinal disturbance which we all meet day after day in dealing with children.

In one group we will place infants under one year. It is in this group that one sees the most marked intestinal disturbances. It is almost always true that in babies having even the mildest head cold, the intestinal tract is upset in some way. Perhaps the most common symptom is anorexia. This may be due to two factors: first, lack of appetite due to absorption of toxin; and, second, the mechanical difficulty of nursing properly because of mucus in the nose. Most small babies who have a cold refuse to eat properly because of these two reasons. I shall not attempt to discuss the treatment of acute colds except to emphasize the importance of elevating the head of the baby so as to prevent gagging and choking and also to recommend the use of some type of nasal drop to help the breathing. Ephedrine solutions have usually proved the most satisfactory in my experience.

Vomiting is perhaps the next most common symptom and this may vary from simple regurgitation to marked nausea, with continued retching. In infants there does not seem to be any effective means of stopping this except by trying to cure the infection itself. Care should be taken not to force food. There is considerable danger that in nursing babies the mother's milk supply may diminish because of inadequate emptying of the breasts. Expression should be used to prevent this.

Diarrhea very commonly occurs in infants who have an upper respiratory infection. Usually the baby has only a moderate increase in the number of stools, and there is no serious loss of fluid or mineral salts. In these mild cases the stools usually contain mucus and they may be moderately loose. It is ordinarily unnecessary to do anything in this type of case but treat the upper respiratory infection, as the diarrhea is not severe enough to affect the baby, and it disappears as soon as the respiratory infection is cleared up.

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Occasionally, however, one sees a baby suffering with an upper respiratory infection, in which there are frequent, watery stools and in these cases evidence of severe fluid loss soon appears. In such cases the administration of protein milk will usually control the diarrhea. This may be given either alone or the protein powder may be given diluted with breast milk, water, or a simple milk mixture. One teaspoonful of the powder given before each feeding is usually adequate. If the baby shows evidence of serious dehydration, subcutaneous fluids should be given.

Often infants with upper respiratory infections have colicky pains caused by gas or abdominal distension. Relief can be given by the use of enemas.

Older children also have gastrointestinal disturbances with upper respiratory infections, but the symptoms are usually not so marked in the milder infections, such as head colds, as in infancy. Anorexia is often present even in simple colds, but vomiting, diarrhea and abdominal pain usually do not occur except in the severer forms of infection such as tonsillitis, pharyngitis, bronchitis, la grippe, influenza or pneumonia. In these more severe infections the intestinal symptoms may be marked. Vomiting very commonly occurs at the onset of any of these infections. It may be severe, but usually lasts only a short time. Aside from the treatment of the infection, no treatment is required for the vomiting except the withholding of food until the nausea disappears. The most troublesome intestinal symptom which older children develop in these infections is acute abdominal pain.

Brenneman called our attention to the frequency of acute abdominal pain in tonsillitis. It occurs not only in tonsillitis but also in other upper respiratory infections. The pain may be severe, and, unless one is on his guard, may lead to a false diagnosis of appendicitis. This acute abdominal pain is, as we all know, very frequently present in pneumonia, particularly of the lobar type. Careful physical examination will usually make it possible to rule out appendicitis. Enemas and application of heat will ordinarily relieve the pain, except in cases of pneumonia. Here usually there is referred pleuritic pain, in which case strapping of the affected side will often give relief.

Diarrhea, although occasionally present in older children suffering with upper respiratory infections, is seldom severe enough to be a disturbing element. One sometimes sees a child with upper respiratory infection who becomes severely constipated. Simple cathartics and enemas will relieve the condition until the respiratory infection subsides and then the condition will correct itself. Abdominal distension, flatulence or tenesmus may occur, but respond to simple methods of treatment and disappear with the upper respiratory infection.

We wish finally to speak of the type of gastrointestinal disturbance so prevalent among children in the last few years, commonly called "intestinal flu," "stomach flu," "intestinal grippe" or probably more correctly called epidemic upper respiratory infection with gastrointestinal symptoms. We realize that probably none of these names is perfectly correct and that at the present time any intestinal disturbance which a child may have, from the simplest condition to the most severe, is often diagnosed "intestinal flu." Certainly this term is very promiscuously used and in fact many grave and fatal errors in diagnosis have been made because of the increasing tendency to diagnose all intestinal disturbances as intestinal influenza, regardless of the true etiology or pathology of the particular condition. In this paper we shall speak of that condition having certain definite characteristics, which to us make it a definite entity. Whatever may be the organism or other etiological factor, it seems to us that we can recognize a definite clinical picture, which for want of a better term we shall call epidemic upper respiratory infection with marked gastrointestinal symptoms. The clinical picture varies in different children but there are certain characteristic symptoms and findings which make it possible to make a definite diagnosis. The outstanding symptoms are gastrointestinal. Usually the onset is sudden, but in some cases the marked intestinal symptoms are preceded for one or two days by an ordinary head cold. The usual story, however, is that a child is taken suddenly with severe vomiting attacks. Unlike the vomiting which follows a dietary debauch of childhood and is severe for a short time, but stops as soon as the stomach is empty, the vomiting in this condition persists. The child vomits continuously and finally continues to retch when only a watery fluid is thrown up. There is rather marked prostration accompanying the nausea. The vomiting may

last from a few hours to several days, and in those cases where it persists for two or three days marked dehydration and symptoms of acidosis may appear. In other cases diarrhea may be the only intestinal symptom present, but in most cases in which diarrhea occurs it is present along with continued vomiting. The diarrhea is rather definite in character, the stools being loose, foul and almost always light in color. These colorless chalky stools are almost diagnostic of the condition. There may be a high temperature (103-104) present in the condition under discussion, but usually the temperature is of a low grade (100-101). Abdominal pain of a cramp-like and intermittent nature is very frequently present and this may persist long after the vomiting and diarrhea have stopped. The pain is generalized and there is little or no abdominal tenderness present, and no muscle spasm.

As stated above, upper respiratory symptoms may be present in the form of nasal discharge, and in some cases there is a slight hacking cough and occasionally the child may complain of a sore throat, but in the great majority of cases there are no symptoms, either objective or subjective, to lead one to suspect the presence of an upper respiratory infection. It is only on physical examination that one realizes that he is dealing with an infection of the upper respiratory tract. Invariably when the throat is examined one sees increased reddening of the pharynx, most marked around the anterior pillars. One also notices an engorgement of the blood vessels of the posterior pharynx. The tonsils (if present), although reddened, are usually not swollen and there is very seldom any exudate nor is there an increased amount of mucus in the throat. Occasionally one may hear evidences of bronchitis and in many instances otitis media with reddened ear drums may occur as a complication, but in the vast majority of children the only physical findings in the respiratory tract are the reddened pillars and injected pharynx.

In those cases where a leukocyte count is made one almost invariably finds a slight leukopenia.

Although the acute intestinal symptoms usually subside in from a few hours to two or three days, many children do not completely recover from the infection. Time and again a child is brought to the physician with the complaint that following one of these infections the child does not seem to return to his normal health. The mother says that the child won't eat well, tires easily, is irritable and that there are occasional days when there is vomiting, diarrhea or constipation. Also many of the children continue to complain of abdominal cramps. The child does not seem to be really sick, but drags around and has more or less vague intestinal and generalized symptoms that keep him from feeling perfectly well. This state of affairs may continue for only a few days after the acute attacks, but in some children it lasts for weeks.

In discussing the treatment of this epidemic form of upper respiratory infection with intestinal symptoms, I am simply going to describe the form of treatment that has worked out most successfully in my experience. I know that there are other methods of treatment which have proved successful with other men, but the methods I shall describe have proved most satisfactory in the cases that have been under my care. When the child shows the first signs of vomiting or diarrhea he should be put to bed and kept absolutely quiet. The more he moves around the longer the intestinal symptoms seem to last. This is particularly true with those who are vomiting. They should be kept in bed until all temperature, vomiting or diarrhea have stopped for at least twenty-four hours. As soon as the child or infant first shows signs of nausea he is given French Vichy water in small amounts (½ to 1 ounce), whenever he wants water. No regular water is given until he has been free from nausea for at least eight hours. The most effective method that I have found to stop the nausea has been the administration of French Vichy water in place of regular water.

No food is given to those children who are vomiting until there has been an interval of at least four hours with no vomiting or retching. In the children who are old enough to ask for food, nothing is given until they themselves demand it. In infants, if there has been an interval of four hours during which there has been no evidence of nausea, they are offered breast milk or their regular milk mixture, but if they do not want it, no effort whatever is made to force them. If they are old enough to get cereal, this is offered before milk. In the older children nothing but gelatin or Jello, dry toast and soda crackers are given for the first twenty-four hours after food is started. If they are still free from nausea at the end of that time, cereal, broth and

fruit juices are added. At the end of the next twenty-four hours if they are still free from nausea, they are put back on their regular diet. It is at this time that milk is first added to the diet.

No medication of any kind is given. This applies to cathartics, antipyretics and sedatives. It has been my experience that the more medicine one gives the longer the vomiting continues. There is an exception to this general rule of no medication in those severe cases where marked restlessness has occurred. In these cases, I have found chloral hydrate per rectum to be of value. Where the child is suffering from abdominal cramps I advise enemas, which almost invariably give relief. They may have to be repeated several times in the course of the day.

The treatment for those children in whom diarrhea is the outstanding symptom is essentially the same as in those with vomiting. They are given no food until they ask for it. The diet consists of gelatin, Jello, dry toast, cereal, soda or arrowroot crackers, broth and weak tea. After the first twenty-four hours if no vomiting has occurred, they are allowed milk which has been boiled for five minutes. No vegetables or fruits are given until the diarrhea has stopped. Where there is no nausea they are given regular water in large amounts in place of the Vichy water. No medication is given to control the diarrhea. Enemas are used if there is abdominal distension or cramps. Those children having either marked vomiting or diarrhea or both are carefully watched for any signs of dehydration or beginning acidosis and fluids are given by hypodermoclysis immediately when warranted.

As stated before, there are a fairly large percentage of children who, following the acute stages of this disease, fail to recover completely and continue to have more or less severe intestinal disturbances. I have found that the administration of Bulgarian or acidophilus bacilli in some form seems to act almost as a specific in this condition. Inside of a very few days the intestinal symptoms and the feeling of malaise will disappear and the child return to normal health. The simplest and most effective means of giving Bulgarian bacilli is in the form of Bulgarian buttermilk, when it can be obtained and the child can be made to take it. The youngster is given at least one pint a day and as much more as he wants. However, many children do not like it, and when their appetite is poor and they do not feel well anyway, it is sometimes almost impossible to get them to take it. In these cases I have the mother give the acidophilus bacilli in the form of chocolate covered acidophilus blocks or in the liquid cultures of acidophilus bacilli that some of the pharmaceutical houses dispense. There is no difficulty in giving the acidophilus bacilli in these ways and the results are usually very satisfactory.

In conclusion I wish to emphasize again the great frequency with which gastrointestinal symptoms occur in infancy and childhood with upper respiratory infections and the varied forms which these symptoms may present. I would call attention to the prevalence of a rather specific upper respiratory infection which has been present in this part of the country for the last few years, in which the intestinal manifestations completely overshadow those of the respiratory tract. Because of its prevalence there has been a tendency to diagnose all intestinal disturbances in children as this infection and grave errors in diagnosis have been made. One should never make a diagnosis of "intestinal influenza" or "grippe" until he is sure that he is not dealing with an acute appendix, an intussusception, typhoid fever, pyelitis or any of the other conditions which can simulate the clinical picture of epidemic upper respiratory infection with marked gastrointestinal disturbance. Failure to make a correct diagnosis may lead to disaster for the patient.

MENINGO-ENCEPHALITIS—A COMPLICATION OF EPIDEMIC PAROTITIS

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PAROTITIS is usually a harmless disease, but it may present a wide variety of complications which render it, at times, extremely serious. Orchitis is the most frequent complication and usually runs a benign course. Other complications reported are epididymitis, neuritis, endocarditis, nephritis, arthritis, mastitis, ovaritis, vulvovaginitis, and meningo-encephalitis. The incidence of these complications varies with different epidemics. The epidemic recently observed in Duluth has brought to our attention three cases with meningo-encephalitic involvement, evidently an indication of an infective strain with neurotropic tendencies.

The occurrence of frank symptoms of central nervous system involvement is relatively infrequent. Gunderson[1] concludes, from a study of the epidemic occurrence of mumps in Norway during the last one hundred years, that there is reason to look upon this infection as the origin of lethargic encephalitis. He states that epidemics of mumps recur regularly every eight to ten years, and during these epidemics the occurrence of secondary encephalitis and secondary serous meningitis is observed, and occasionally primary mumps meningitis without parotitis occurs. In all, about two hundred cases have been reported, of which about sixty have been described in the English literature. The majority of the cases have been reported in France and the South American countries. Schoenthal[2] states that the occurrence of meningitis in mumps receives little mention in German pediatric literature. Acker and Casparis have summarized the literature up to 1913 and 1919, respectively. Since then not more than sixty cases have been added. As most patients recover after three to ten days illness, it is very probable that the meningeal condition is lost sight of, particularly in the milder cases, and this very likely accounts for the fact that so few are on record and so little is known of this complication. The symptoms may occur before or after the parotid involvement, but they usually occur at the height of the disease. In two of our cases the meningo-encephalitic involvement was the only manifestation of mumps. Howard[5] reports three, and Wallgren[6] reports two such cases.

The symptoms of meningo-encephalitic involvement may vary a great deal, but usually consist of a rise in temperature, headache, nausea and vomiting (at times projectile), stupor, prostration, and nervous hyperirritability. Del Sel,[7] Walker,[8] Wallgren,[6] Shoenthal[2] add bradycardia to the above common symptoms. Joltrain[9] calls bradycardia a characteristic. This was not manifested in our cases. Photophobia, unilateral or bilateral deafness, monoplegia, hemiplegia, aphasia, speech disturbances, and psychic disturbances may be other expressions. Objective findings may reveal a positive Kernig and neck rigidity. Wallgren reports an instance of facial paralysis and also right arm and leg paralysis with recovery. Larkin,[10] in a report of two cases, described one case of paralysis of the left arm and the right leg. In the cases reported the complication appears more frequently in males than in females.

The spinal fluid findings are quite characteristic and with the history are diagnostic. In general, the authors agree that there is a clear or slightly cloudy fluid with increased pressure and a cell count of 20 to 2,000 with a predominance of lymphocytes (80 per cent or over). No microörganisms are found on smear or culture, but a slightly positive Nonne is present. Larkin reports two cases with normal spinal fluid, while Haden[11] and Howard[5] each report two cases with gram-positive diplococci. Blood findings usually are normal, but there may be a leukocytosis up to 18,000 with a percentage increase of lymphocytes. The temperature rarely is elevated above 103.8°. The few necropsies which have been recorded have shown a very marked congestion of the brain with a serous meningitis.

M. H. Gordon[12] injected ten monkeys intracerebrally with a bacteria-free filtrate from an uncomplicated case of mumps. Four of the ten

monkeys developed symptoms of nervous disturbance and died in three to nine days. The postmortem examination was negative grossly except for fatty changes in the kidney tubules and congested areas in the liver. No pus was found in the central nervous system, but some congestion was present. Section of the cord showed a variable degree of infiltration in the pia arachnoid with lymphocytes, as well as hyperemia. A certain proportion of nerve cells, both in the cortex and in the anterior horn cells of the cord, showed pronounced degenerative changes.

The diagnosis is not difficult when epidemic parotitis accompanies or precedes the symptoms of central nervous system involvement, and when one finds the rather typical spinal fluid findings. It is, of course, more difficult when no parotitis is present, but in the presence of a mumps epidemic and direct exposure in a non-immune person, with the spinal fluid findings and the short convalescence, particularly after spinal drainage, one is almost certain as to the diagnosis.

In the differential diagnosis one must consider tuberculosis, epidemic cerebrospinal meningitis, and epidemic encephalitis.

SPINAL FLUID FINDINGS

Date	Amount	Pressure	Appearance	Number of cells	Pereentage of lymphocytes	Nonne	Smear and Culture
1/28	5 c.c.	Normal	Sl. Hazy	—	89	—	Negative
1/29 a. m.	15 e.e.	Normal	Hazy	680	86	trace	Negative
1/29 p. m.	15 c.c.	1+	Hazy	562	95	—	Negative
1/30 a. m.	25 e.e.	1+	Sl. Hazy	689	88	—	Negative
1/30 p. m.	15 c.c.	1+	Clear	540	87	trace	Negative
1/31	10 c.c.	Normal	Clear	544	—	—	Negative

CASE REPORTS

Case 1.—G. C. C., a schoolboy, aged 11, was admitted to the hospital on the serviee of Dr. C. O. Kohlbry, January 28, 1929. There was no definite history of mumps, but an epidemie existed and a history of probable contact.

Present Complaint: (1) Frontal headaehe; (2) fever; (3) nausea and vomiting; (4) hyperirritability; (5) general malaise.

Present Illness: The mother stated that the patient was chilled on January 26. He was put to bed because of a severe headache and the eomplaint of light hurting the eyes. The child was also very irritable. On January 27 the headache persisted with some projectile vomiting and high fever.

Past History: The child had had whooping cough, measles, scarlet fever, chicken pox and tonsillectomy.

Physical Examination: The patient was a well developed, well nourished boy, restless and apparently extremely sick. The eyes reacted to light and aceommodation, the eye grounds being entirely negative. The throat was somewhat injected and there was some rigidity of the neck museles. Reflexes were normal throughout. The Kernig and Babinski reflexes were negative. The temperature on admittanee was 101° F. but rose to 103° F. in the afternoon. Spinal puncture yielded 5 e.c. of a elear fluid.

Laboratory: Blood and urine were normal.

Course and Treatment: On January 29, his temperature was 103.4 F.; there was a slight Kernig reaction, some headache and marked irritability. Spinal puncture was performed at 10 a. m. and 6 p. m. On January 30, temperature reached 103 F., headache was intense, there was pain in the eyes and the neck was rigid. The Manteau and Von Pirquet tests were negative. Spinal puneture was done at 11 a. m. and 10 p. m. On January 31, the temperature was 102.2 F., neck stiffness was unchanged, Kernig's sign was definitely positive. Spinal puncture was done. On February 1, temperature was 100.6 F., neck rigidity less, Kernig less marked, and patient feeling much better. *X*-ray of the lungs showed calcified glands in the left hilum. On February 2, temperature normal, no neck rigidity, Kernig negative, and patient feeling much better. The patient was discharged the same day.

Case 2.—W. B., a male, aged 17, was admitted to the hospital April 19, 1929, on the service of Dr. F. J. Hirschboeek.

Present Complaint: (1) Delirium; (2) amnesia for past two weeks.

Present Illness: On April 4 the patient was taken ill with mumps. He went to work the next morning, but returned home in the afternoon because of headache, nausea and vomiting, feverishness, and lethargy. Patient was put to bed on April 5, and since then remembers nothing about his illness. He was sent to the hospital for observation and treatment.

Past History: Patient had had measles, whooping eough and chicken pox.

Physical Examination: The patient was a fairly well developed and nourished young male, lying comfortably in bed. The eyes reacted to light and accommodation. The eye grounds showed slight increase in redness of the disc and retina. The throat was slightly injeeted. The examination was otherwise negative. The temperature on admittance was 97.6 F.

Course and Treatment: On April 19, spinal puncture showed a cell count of 55, lymphocytes predominating; Nonne showed a trace; eolloidol gold eurve was negative; Wassermann negative. The patient improved rapidly after spinal puncture and was permitted to go home two days later, apparently in good condition.

Case 3.—M. S., a male, aged 36, was admitted to the

hospital on April 17 on the service of F. J. Hirschboeck.

Present Complaint: (1) Fever; (2) headache; (3) nausea and vomiting; (4) general malaise; (5) tenderness in right testis.

Present Illness: Symptoms began on April 10 with general malaise, chills, fever and sweats. Two days later he developed a generalized pain which became more severe in the abdomen and head. Vomiting has persisted for the past two or three days, and a mild diarrhea with increase of fever developed.

Past History: Tonsillectomy; had contact with mumps. One child in family has mumps. No other sickness was present in the community.

Physical Examination: The patient was a well developed, well nourished white male, lying fairly comfortable in bed. The eyes reacted to light and accommodation. There was no tenderness of the parotids. The throat was slightly injected and there was a slight rigidity of the neck muscles. There was some general tenderness in the epigastrium with a suggestion of a spasm on the right side. The right testis was definitely tender, but there was no marked enlargement. The reflexes were normal. The temperature on admittance was 101 F. The blood and urine were normal.

Course and Treatment: On April 18 the temperature was 102.2 F. The patient felt better and the abdomen was less tender. There was still a slight rigidity of the neck muscles. On April 19 the temperature was 102 F. A spinal puncture showed 20 cells, mostly lymphocytes; the Nonne was positive; the colloidal gold curve was 000011100. He felt much better after the puncture.

On April 20 the temperature was normal and there was no headache or neck rigidity. He was discharged April 21, feeling perfectly well.

SUMMARY

Case 1 showed no definite relationship to mumps aside from the presence of an epidemic and exposure to infection. The usual symptoms, physical findings, spinal fluid findings, and the rapid recovery with spinal puncture suggest the diagnosis. Case 2 gives a history of definite parotid involvement, following which the meningo-encephalitic manifestations were expressed by delirium and amnesia, which cleared up promptly with spinal puncture. Case 3 gives a history of mumps in the family and an orchitis with meningeal symptoms which cleared up promptly with spinal puncture.

From these cases and review of the literature, mumps meningitis seems to be an infrequent and unusual complication. It is usually manifested in the epidemic type rather than in the sporadic type of parotitis. The spinal fluid is either clear or slightly cloudy, with an increase in cells from 20 to 2,000 with a predominance of lymphocytes. Age seems to play a large part in the degree of cellular reaction shown by the spinal fluid in case 1, and the adult cases 2 and 3.

The diagnosis is made on the following:

1. The meningeal symptoms in the presence of parotitis or orchitis or an epidemic of parotitis usually beginning insidiously with a headache, vomiting, hyperirritability, general malaise, and some fever.

2. The spinal fluid findings and the relief obtained by spinal puncture.

3. The well-being of the patient during the course, which is very short.

4. The rapid recovery, which is usually complete. The treatment is spinal drainage.

For the privilege of studying these cases and for helpful criticisms the author is obligated to Drs. F. J. Hirschboeck and C. O. Kohlbry.

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THE RECTAL EXAMINATION AND THE CONCEALED SECOND STAGE OF LABOR

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THE purpose of this paper is to point out a potentially serious danger in the rectal examination, namely, the danger of overlooking a concealed second stage of labor.

The following question immediately suggests itself: If a serious danger is resident in the rectal examination, why counsel its use when a vaginal examination permits greater accuracy of diagnosis? This question can be satisfactorily answered only after a thorough consideration of the relative merits of the rectal and vaginal examinations.

As far as I know, it has never been proven that, with any approximation to care in technic, the rectal examination can introduce bacteria into the vagina. From this standpoint it may be considered as harmless as no examination. If pathogenic bacteria are already in the vagina at the beginning of labor, due to an infected cervix or due to their introduction by intercourse, digital examination, septic douche nozzles, douches, etc., within a few days prior to labor, the rectal examination cannot be expected to protect the patient from the likelihood of a postpartum infection. In such a contingency, it has been objected that by a rectal examination one will smear the pathogenic flora over the inside of the cervix. The mechanism of normal labor is open to the same objection because the advance and recession of the presenting part and the bridge of membranes must tend to spread the vaginal flora. It is likely that in any labor, as soon as the cervix dilates and the cervical plug of mucus is dislodged, the vagina and uterus become one cavity and act as a Petri plate as regards extension of bacteria, modified of course by the flow of discharges and the bactericidal character of the secretions. The work of J. Morris Slemons[1] on placental basteremia tends to substantiate this likelihood; also the statistics of increased likelihood of infection following the performance of cesarean section late in labor and after the rupture of the membranes even when no vaginal examinations have been made. No bacteriologic proof has been offered, to my knowledge, of the spreading of bacteria by the rectal examination. However, statistics exist that suggest that no examinations in labor may be less productive of postpartum rise of temperature and infection than the rectal examination. Even if this were certain, the fact remains that, in the course of teaching and practice, a comparatively few cases can be allowed to go without a pelvic examination because of the demands of diagnosis, of following the progress of labor, and of handling the problem of alleviation of pain in labor.

Ralph A. Reis,[2] in an analysis of 271 cases examined by rectum only and 106 cases where no examinations were made, recorded the following findings:

AFEBRILE CASES

All cases

No exam.	56%
Rectal	46%

Spontaneous cases

No exam.	64%
Rectal	54%

PELVIC INFECTIONS

All cases

No exam.	4.7%
Rectal	6.3%

Spontaneous cases

No exam.	4.9%
Rectal	6.6%

To my mind the figures of Reis point more clearly to the importance of prenatal care than to a clear deduction of the advantages of no examination over the rectal examination.

Concerning the vaginal flora of pregnant women and the potential danger of the vaginal examination we have much evidence at hand.

In 1894, Krönig[3] concluded from a study of 100 pregnant women that "the vaginal secretion of pregnant women who have not been examined, no matter whether normal, pathological, or highly pathological, never contains organisms which grow aërobically upon the ordinary media at the body temperature except yeast and gonococci and therefore never contains septic bacte-

ria." "The vagina of every pregnant woman who has not been examined is therefore aseptic."

In the same year Krönig[4] demonstrated that the vaginal secretion possessed a marked bactericidal action upon pathogenic organisms when introduced into the vagina and stated that "we may consider the vagina of a pregnant woman as aseptic if we are sure that two or three days have elapsed since she was touched."

In 1898 J. Whitridge Williams[5] published a report on the bacteria of the vagina and their practical significance based upon the bacteriological examination of the vaginal secretion of ninety-two pregnant women. His conclusions were:

1. "We agree with Krönig that the vaginal secretion of pregnant women does not contain the usual pyogenic cocci, having found the staphylococcus epidermis albus only twice in 92 cases, but never the streptococcus pyogenes or the staphylococcus aureus or albus.

2. "The discrepancy in the results of the various investigators is due to the technic by which the secretion is obtained.

3. "As the vagina does not contain pyogenic cocci, auto-infection with them is impossible; and when they are found in the puerperal uterus they have been introduced from without.

4. "The gonococcus is occasionally found in the vaginal secretion and during the puerperium may extend from the cervix into the uterus and tubes.

5. "It is possible but not yet demonstrated, in very rare instances, that the vagina may contain bacteria which may give rise to sapremia and putrefactive endometritis by auto-infection.

6. "Death from puerperal infection is always due to infection from without and is usually due to neglect of aseptic precautions on the part of the physician or nurse.

7. "Puerperal infection is to be avoided by limiting vaginal examinations as much as possible and cultivating external palpation. When vaginal examinations are to be made, the external genitalia should be carefully cleansed and disinfected and the hands rendered as aseptic as for a laparotomy. Vaginal douches are not necessary and are probably harmful."

To paragraph 6 of Dr. Williams' deductions I would like to add, intercourse within a few days of labor, manual vaginal examinations by the patient, and unsterile douche nozzles and douches. I have felt justified in attributing many cases of sepsis to each and every one of these causes, where no examinations or operative procedures of any kind had taken place during labor and the preparation of the patient and the delivery technic and postpartum care were apparently as nearly perfect as possible. Postpartum sepsis following spontaneous deliveries during which no examination, or rectal examinations only were used, I believe to be attributable to infractions of prenatal care instructions or to failure to give any prenatal care instructions.

In 1902 Hjalmar Bergholm[6] published a most searching bacteriologic study of the vaginal secretion in pregnancy. His conclusions coincide with those of Krönig and Williams as regards the sterile character of the vaginal secretions in pregnant women. He states that "neither the staphylococcus pyogenes albus or aureus nor streptococcus pyogenes nor bacillus coli, is to be found in the vaginal secretion of the pregnant woman. The flora of the vulvar secretions is materially different from that of the vaginal secretions."

All these investigations permit one to feel with a large degree of assurance that, barring the presence of gonorrheal infection, meticulous prenatal care should bring the pregnant woman to labor with a sterile vagina. The consideration from the beginning of labor is to keep it sterile. Many of us believe that the rectal examination will do this, barring lapses in aseptic technic in the preparation of patient for labor and in the conduct of labor and the puerperium.

In this regard, what do we know about the safety and the potential danger of the vaginal examination conducted under strict aseptic technic?

We know of course that the better the technic the less chance there is of introducing infection into the vagina. Striking proof of the benefit of refinements in technic is brought out in the 1913 reports from the Sloane Hospital for Women, New York City. In these reports Dr. E. C. Lyon, Jr., showed that the routine use of the sterile rubber glove in vaginal manipulations markedly reduced the incidence of sepsis. In 16,000 cases before rubber gloves were routinely used, the incidence of sepsis was 1.13 per cent. In the last 12,000 cases in which the sterile rubber gloves

were routinely used the incidence was .61 per cent.

The most striking bacteriological demonstration of the potential danger of the vaginal examination can be found in a comparison of the researches of J. Whitridge Williams[7, 5] in 1893 and 1898. In his earlier work Williams found pyogenic cocci in the vagina in 53 per cent of his cases, including 20 per cent streptococci. In his later work, he found pyogenic organisms in only 2 per cent of the cases and not a single streptococcus. Williams' explanation of these differing results is, "the only explanation which suggests itself is that in the first series of cases bacteria, which were upon the labia minora and the margins of the hymen, were carried into the vagina by the introduction of the speculum and were then demonstrated in the cultures, while in the present series that possibility was avoided." The speculum referred to was a sterilized cylindrical glass speculum about two centimeters in diameter. In other words, it was about the size of the examining finger.

The potential danger of the vaginal examination suggested itself to Slemons[5] in his work on placental bacteremia.

The potential danger of the vaginal examination is apparent in the comparative statistics of cesarean section without and with previous vaginal examinations.

As regards the actual statistical data concerning the relative safety of the aseptic vaginal and the rectal examination, one cannot find many large series in literature.

Pfleiderer[8] cites Jegge (Basel) as having compared 500 cases examined vaginally with 500 cases examined rectally. Those examined vaginally developed temperature in 11 per cent of cases as against 6 per cent with the rectal examination.

Guggisberg[9] presents compelling figures from the Poliklinik at Bern.

1902-1911

Cases examined vaginally	4,642
Temperature reached 37.5	17.5%
Genital infection	11.2%
Deaths from sepsis	.12%

1912-1921

Cases examined rectally	3,010
Temperature reached 37.5	11%
Genital infection	5.5%
Deaths from sepsis	0

I have been unable to find in literature any comparative statistics equal to these statistics in point of number of cases compared in which the vaginal examination appeared to be more safe than the rectal examination.

Reis[2] compared results in 609 cases examined by vagina, 271 cases examined by rectum, 106 cases delivering without examinations.

PELVIC INFECTIONS

All cases

Rectally examined	6.3%
Vaginally examined	5.9%
No examinations	4.7%

Spontaneous cases

Rectally examined	6.6%
Vaginally examined	5.3%
No examinations	4.9%

Reis also tabulated his cases according to whether they were febrile or afebrile. Any patients showing more than one-half of a degree centigrade rise of temperature at any time during the first seven days postpartum were considered, for the purposes of this investigation, as being febrile.

AFEBRILE CASES

All cases

Vaginal only	47%
Rectal only	45%
No examination	56%

Spontaneous cases

Vaginal only	57%
Rectal only	54%
No examination	64%

Reis made this investigation in 1914 in an attempt to determine what difference, if any, in morbidity rate and infection rate occurred following the two types of examination in a well-conducted maternity. He concludes:

"It would seem, from a study of the figures presented above, that the percentage of absolutely afebrile cases is definitely increased when neither rectal nor vaginal examinations are made and conversely that the percentage of pelvic infections is definitely decreased. There appears, however, to be practically no difference between the group examined vaginally and the group examined rectally. This holds true for the percentage of afebrile cases as well as for the percentage of pelvic infections. If then, as most workers agree, the rectal examination is only 90 per cent efficient for diagnosis, and if it is especially inadequate in abnormal and pathological cases,

it would seem that at least one vaginal examination is desirable early in every case of labor, particularly since there is no increased danger of infection from such an examination if carefully and properly done. That the number of vaginal examinations should be limited as much as possible is self-evident from a study of the figures presented.

"The rectal examination is, however, of value in observing the progress of labor and should supplement the initial vaginal examination. The rapidity and ease with which the rectal examination can be made recommend it strongly, but it does not seem that the rectal examination should replace the vaginal examination, especially in a well-conducted maternity where vaginal examinations can be made under aseptic conditions."

In the early part of his article Reis says: "In this series, the majority of cases was examined vaginally because the routine care of service cases in the Michael Reese Maternity required one careful vaginal examination immediately upon admission and preparation of the patient. The only exceptions to this routine are cases of appreciable vaginal bleeding or patients whose histories, measurements, or abdominal examination might indicate the possibility of a cesarean section."

After viewing from all angles the results of bacteriologic research, and all comparative statistics extant at the time concerning the relative safety of the vaginal and rectal examinations, I was led, in 1913, to change from the use of the routine vaginal to the routine rectal examination. Since that time, each year's experience, in all types of situations and conditions, has added to my conviction that the rectal examination is potentially the safer examination and that the vaginal examination, under the most meticulous aseptic technic, should be used only when the rectal findings leave one in doubt. It is my belief that the universal teaching and use of the rectal examination, considering all types of conditions surrounding the obstetric patient, would reduce the incidence of postpartum sepsis.

The following advantages are resident in the rectal examination:

1. With any approximation to care, the rectal examination cannot introduce bacteria into the vagina.

2. The sterilizable rubber glove, combined with ordinary cleanliness and gentleness, makes it possible for even the most inexperienced student to conduct the examination without danger to the patient.

3. Without any increase in danger to the patient, the rectal examination permits of repeated examinations in all types of surroundings irrespective of any limitations offered by the examiner's training and perfection in aseptic technic.

4. It permits of repeated examinations with a great saving of time to the attendants and the examiner and with a great saving of inconvenience to the patient because of the fact that the rectal examination does not require the elaborate preparation for its performance necessitated by the aseptic vaginal examination.

5. Its teaching and use seems to emphasize the potential danger of the vaginal examination and stimulates all attendants to use as careful methods of preparation for performance of the vaginal examination as should be called for in the preparation for any obstetrical operation.

6. In over 95 per cent of cases that will terminate spontaneously, the rectal examination, in conjunction with the abdominal examination, will meet all the requirements of teaching and practice by giving all the data necessary for diagnosis, for following the progress of labor and for scientifically handling the problem of the alleviation of pain in labor.

7. In any case in which only rectal examinations have been used, if the necessity for interference arises we can institute said interference with the assurance that the rectal examinations have not introduced pathogenic bacteria into the vagina. Especially is this of great importance in cases complicated by antepartum hemorrhage and in those cases in which from the history, physical, and measurements we suspect that a cesarean section may be indicated with or without a test of labor.

The present-day knowledge, among educated people, of the danger of infection in labor makes the use of the rectal examination a source of reassurance to the patient and her family. When only rectal examinations have been used, if a postpartum rise of temperature takes place, the physician and the patient's family can have an increased feeling of security engendered by the fact that no infection could have been introduced

into the vagina by the rectal examination. To me this feeling of greater security following a delivery without vaginal manipulations is of great value because it acts as a source of confidence in the ultimate outcome of the case and decreases the strain of practice.

There are certain basic elements in the technic of the rectal examination that are of great importance in rendering it without danger.

First and foremost, the gloves used should be boiled so that no infection can be taken from case to case. The hands should be washed and dried, the gloves drawn on the examining hand and plenty of sterile lubricating jelly or vaseline applied to the examining finger. One must be careful not to frustrate the nursing technic of keeping the external genitalia clean. The examiner must be careful to keep away from the vulva. It is easy for the thumb of the examining hand to come in contact with the vulva or even enter the vagina if one is not aiming to avoid such a slip.

Although it is conceivable that one could be so careless and rough as to injure the anus and rectum, I have never seen such an injury. Even to the uninstructed, gentleness suggests itself, or is suggested by the patient.

It is unquestionably true that it is more difficult for the student to master the rectal examination than for him to master the vaginal examination in respect to accuracy of findings. But this difficulty is largely offset by the increased number of examinations he is allowed to make and therefore by his increased experience. My experience has taught me that the best way to initiate teaching in the rectal examination is to initiate it in the gynecologic and obstetric outpatient department, where on all gynecologic cases and on all pregnant cases in the early months the rectovaginal examination may be made and the student can check up his rectal findings by his findings with the vaginal finger. In this way he soon learns to delineate the cervix and appreciate its varying consistency and he soon learns the feel of an external os that will admit the finger. He also learns to appreciate any slight difficulties offered by the rectovaginal septum and the rectal valves. By the same token, rectal examinations alone, of patients in the last six weeks of pregnancy, especially in multiparæ, are most instructive because in many of these cases the presenting part is easily felt and obliteration of the cervical canal and even dilatation has in many instances gone far enough to be distinctly manifest. If a student has had this practice he will soon master the rectal examination in labor. The potential accuracy of the rectal examination was impressed upon me lately when, in going over four hundred consecutive labors, I found that no vaginal examination had had to be used in spontaneous deliveries and in operative deliveries the preliminary vaginal check had substantiated the rectal findings.

All errors associated with a diagnosis by rectum of complete dilatation of the cervix have been in my experience without serious consequence. We have all likely experienced the inconvenience of being called by an intern and found the patient prepared and draped for immediate delivery and, when nothing happened, discovered upon rectal examination that he had not reached far enough to find the os and had mistaken a well obliterated cervical canal with a slight dilatation of the external os for complete dilatation. This mistake, though inconvenient, could cause no harm. We have all no doubt experienced the mistake of diagnosing complete dilatation in the presence of a tissue paper cervix with a pinpoint os. I have seen this mistake made with a vaginal examination and the mistake recognized only after visual examination with a speculum. Again, this is a mistake of little consequence because with no advance, after an arbitrary two or three-hour period, the vaginal examination will have checked up our error.

The only serious error that I have seen resident in the rectal examination is associated with the diagnosis of an undilated cervix. It is a serious error in the interpretation of rectal findings that may lead to disaster from incorrect management. This error consists in overlooking what I have come to designate as a concealed second stage of labor. Call this condition what you will, the rectal findings should lead one to suspect it and corroboration should be sought in the vaginal examination.

The rectal findings consist in a peculiarly soft cervix that hangs down from the presenting part like the open end of a bag; the cervical canal is obliterated but the external os does not appear to be completely dilated; and one is surprised at the ease with which one can pull the cervix from side to side in the attempt to palpate the directing features of the presenting part. During a

pain the cervix may disappear, only to appear again between pains. This is the cervix that may be found upon vaginal examination to be potentially completely dilated and offering no obstruction to the descent of the presenting part.

These findings are present most frequently in conditions interfering with complete flexion of the head or favoring extension of the head. I have encountered it most frequently in occiput posterior positions especially of the frontocotyloid variety.

It is a relatively infrequent condition, however, occurring in my observation in about one per cent of cases. However, as this makes it approximately six times more common than measurements necessitating cesarean section, at least in the State of Minnesota and its environs, and as incorrect handling may make its non-recognition as disastrous as the non-recognition of indications for cesarean section, I consider it relatively important.

The plausible explanations for these findings that suggest themselves are: that the peculiar position of the head by pressure, reflexly interferes with the normal retraction of the cervix; that actual pinching between the head and the pelvis interfered with retraction; and that both of these conditions are associated with the phenomenon that the head extends after previous flexion and jumps away from the dilated os much as a man walking on his head makes the steps by flexing and then suddenly extending his head.

The likely and usual series of events following the non-recognition of this so-called concealed second stage of labor are: the obstetrician carries the woman along in the belief that she is in the first stage of labor and, after hours or days of labor, is puzzled by the fact that there is no advance of the presenting part and no change in the cervix. Finally when signs on the part of mother or child demand interference, the real nature of the condition becomes manifest when one has to decide upon the best maneuver for the successful consummation of delivery. Unfortunately, by this time, especially if the membranes have ruptured early, version, a possible first choice, may be contraindicated and high forceps is the remaining alternative if the head is high. The end-result of course will depend largely upon the dexterity of the obstetrician, but, at best, the chances are not promising because of the condition of the child and mother. Had this condition been suspected and recognized early, it is likely that no contraindication would have existed to interfere with a deliberate choice of the best maneuver for delivery and the delivery would have been executed with the child in good condition and with the mother not exhausted and not in a debilitated condition, making her a more easy prey to any low-grade infection that might be present.

The following two cases are of interest because in each case the condition existed in two successive labors and the difference between correct and incorrect management is clear.

Case 1.—Mrs. E., twenty-five years of age, a primipara, had been well since childhood and had had a normal prenatal history. Physical examination showed no abnormalities.

Measurements: Interspinous 27.5, intercristal 29.5, external conjugate 20, right external oblique 22.5, left normal oblique 22.5, transverse outlet 8.5, promonotory not reached.

O. L. A. position. Patient at full term.

Labor began at 11 p. m. February 22, 1923.

Desultory pains were present for two days, never less than four minutes apart. The patient was sustained with necessary sleep and rest provided by narcotics and soporifics. Light nourishment.

At 8 p. m. Feb. 25th, although the cervix by rectum was distinctly felt to be undilated the patient was taken to the delivery room. No change had taken place in the cervix for hours and there was no progress in descent. By vagina the cervix was found to be potentially completely dilated. The membranes were ruptured artificially and the case allowed to proceed.

No advance occurred in two and three quarters hours. The mother became exhausted and high forceps applied. Position O. L. A. The baby was delivered dead in thirty-five minutes. Bleeding from the nose and left ear indicated a likely fracture of the base of the skull.

Total labor 72 hours, 45 minutes.

Mistakes: A concealed second stage of labor went unrecognized through rectal examination and thus the length of labor was unnecessarily increased. Forceps were chosen rather than version with the head high and little or no moulding.

Final postpartum examination showed the cervix in excellent condition; a practical check that the child was not drawn through an undilated cervix.

Same patient. July, 1924.

Labor began at full term at 5:30 p. m., July 2.

At 9 a. m. July 3, the cervix was soft and not completely dilated as determined by rectal examination. A concealed second stage of labor was considered. At 11 a. m., no change in the rectal findings as to cervix and descent of head, the patient was taken to the delivery room for a vaginal examination. Vaginal examination showed the cervix potentially completely dilated and the head high. The membranes were rup-

tured artificially, immediate version performed and breech extraction. This maneuver was performed with ease and a 9 pound 9⅝ ounce live baby delivered.

Total labor 18 hours.

This labor, I believe, was handled correctly. It would not have been had I not suspected, by the feel of the cervix by rectum, a concealed second stage of labor, and immediately checked up my findings by a vaginal examination. I explained the lack of descent of the head to be due possibly to attitude. Version broke up this faulty attitude.

Case 2.—Mrs. A., twenty-six years of age, primipara. O. L. A. position. At term.

History, physical and antepartum care history normal, except for anemia in the latter part of pregnancy that did not respond to treatment. Her hemoglobin at term was 62 per cent.

Measurements: Interspinous 26, intercristal 28, external conjugate 20, left external oblique 22, right external oblique 22.5. Transverse outlet 8.5; promontory not reached. Normal.

Labor began at 2 p. m. July 22, 1925.

On July 23, at 2:30 a. m., the cervix was soft, the cervical canal obliterated, and three fingers' dilatation. Examination showed the identical findings at 10 a. m. and again at 11 a. m.

At 5:18 p. m., the mother was exhausted and there was no change in the cervix or descent of head. A vaginal examination was made and the cervix was found to be potentially fully dilated, the membranes intact, and an O. L. A. position.

The membranes were ruptured artificially and because of the high position of the head a version and breech extraction was done. A normal 8 pound 6⅞ ounce child was delivered.

Total labor 27 hours 30 minutes.

I should have become suspicious of the concealed second stage earlier and checked up with the vaginal examination. She ran a mild postpartum sepsis and left the hospital on the thirty-first day postpartum. This twelve hours of what I believed, after delivery, to have been an unnecessary extension of labor may have been a factor in her postpartum sepsis through lowering of her resistance, especially in the presence of an anemia.

Same patient, June, 1928. At term. O. D. A. position. Again anemia in the latter part of pregnancy that did not respond to treatment. Hemoglobin 60 per cent.

Labor began at 5 p. m. At 6:15 p. m., rectal examination disclosed a complete obliteration of the cervical canal and two fingers' dilatation.

At 10:30 p. m. the cervix was very soft, there was a three fingers' dilatation, and a concealed second stage was suspected.

At 1:10 a. m. there had been no advance of the head and no change in the cervix. Vaginal examination revealed the fact that the cervix was potentially completely dilated. Membranes were ruptured artificially. O. D. A. position.

Version was chosen because of the high position of the head. Easy version was performed and breech extraction of a living child weighing 8 pounds 6⅜ ounces.

Total labor 8 hours 30 minutes.

Normal puerperium followed except for an anemia.

In this case I feel certain that the early recognition of a possible concealed second stage of labor and a vaginal check saved this woman many hours of unnecessary labor with the concomitant danger of reduced resistance therefrom.

To one experienced in rectal palpation, the danger of error in diagnosing a concealed second stage of labor by rectum when it does not exist, is only the danger of an occasional vaginal examination under the most rigid conditions of asepsis. The dangers likely to attend the nonrecognition of the condition by rectum have been stated.

In the last analysis, conditions of operative dexterity being equal, the ultimate results will depend upon one's ability to recognize a potentially fully dilated cervix by vaginal examination, because, if one attempts an extraction by forceps or a version and breech extraction through a cervix not completely dilated, he courts one of the commonest present-day causes of fetal morbidity and mortality and maternal morbidity.

SUMMARY

1. A summation of the results of bacteriological research and labor statistics bearing upon postpartum sepsis points to the conclusion that, whenever a pelvic examination is necessary in labor for purposes of diagnosis, of following the course of labor and of scientifically handling the problem of the alleviation of pain in labor, it is expedient to use the rectal examination first and the aseptic vaginal examination only in those cases in which the rectal findings leave one in doubt.

2. The greatest potential danger resident in the rectal examination is overlooking what has been called a concealed second stage of labor. In this condition the cervix, though potentially completely dilated, is easily palpated by rectum and may give the impression, to one not keeping the entity in mind, of a cervix not nearly completely dilated, and one may allow the patient to continue on in labor without making a vaginal check, believing that she is in the first stage of labor when she is really in the second stage. Unless one keeps this possibility in mind, one may not find

out his mistake until untoward signs on the part of mother and child demand interference and when, depending upon the time of rupture of the membranes, a choice of the maneuver best suited for a successful delivery may not be made, as, for instance, version with a high head, and when the conditions of mother and child are not so conducive to ultimate success as they would have been had the concealed second stage of labor been suspected and found on aseptic vaginal examination hours before.

3. The rectal findings that should lead one to suspect a concealed second stage of labor are: a peculiarly soft cervix that hangs down from the presenting part like the open end of a bag; a cervical canal obliterated but the external os not appearing to be completely dilated. One is surprised at the ease with which the cervix can be pulled from side to side in the attempt to palpate the directing features of the presenting part. During a pain the cervix may disappear only to appear again between pains. Where these findings exist, make an aseptic vaginal examination and proceed according to the indications.

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CASE REPORT

COMMINUTED FRACTURE OF THE PISIFORM BONE

A CASE REPORT

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Fractures of the carpal bones are of rather common occurrence, but the tendency to underestimate the significance of injuries to the wrist often leads to errors in their diagnosis.

Fractures of the scaphoid and semilunar bones, the most frequent injuries of the carpals, are usually recognized and treated successfully. Lack of recognition of these fractures or improper treatment leads in the case of the semilunar to Kienböch's disease, and in the navicular bone to the progressive loss of function and crippling of an apparently normal wrist. Failure to employ the roentgenogram in these cases results in the patient's being treated for arthritis, neuritis, etc., until finally after many months the condition is recognized and heroic measures are instituted to alleviate the suffering.

Fractures of the other carpal bones are of rare occurrence; and because of their infrequency they are overlooked. The pisiform bone lying in its anterior position to the rest of the carpals is forgotten as a potential source of injury from direct trauma, hyperflexion and indirect violence. This bone differs from the rest of the carpals in its small size and method of origin. It maintains on its dorsal surface a single facet for articulation with the triquital bone. The volar surface is rough and rounded, furnishing attachment to the transverse carpal ligament, the flexor carpi ulnaris and the abductor digiti quinti. In addition, two other small ligaments arise from this bone, the pisometacarpal and the pisohamate ligaments. The lateral surface of the bone is grooved for the ulnar artery.

The mode of development of the pisiform bone is somewhat questionable, some workers believing that it represents a sesamoid bone arising in the flexor carpi ulnaris tendon, while others feel that it is representative of a rudimentary digit.

Fractures of the pisiform are of unusual occurrence, but may be the source of a disabled wrist. R. B. Deane reports a case in a twenty-three year old male who believed he had sprained his wrist. Engel also reports a case of fracture of the pisiform bone in a sixteen year old youth who had sustained an injury to his wrist; he also cites a case of Pfab's in which ossification of the fractured pisiform bone failed to take place and the bone had to be removed. Jean and Solcard report a case of fracture of the pisiform bone in a sailor and call attention to the case reports of Buybout in 1847 and of Alsberg in 1908. Jean in 1924 treated a second case of pisiform fracture in a workman who had been injured in a sixty-foot fall.

Undoubtedly there are more cases of pisiform fracture in existence which have not been reported, but we feel that the rarity of the condition warrants the recording of the following case.

The patient, J. D., forty years of age, was sent to us on July 8, 1929, because of pain in the right wrist and difficulty in moving his right small finger. He stated that while working at Aitkin, Minnesota, as a bricklayer, he completed his job on July 3 and was in a hurry to remove the debris and framework on the building for the Fourth of July celebration. While stripping supports from the building the scaffold on which he stood broke and the patient fell a distance of ten feet to the ground. He landed on his right side, using his right arm to break the fall. From his description his right hand was in the state of hyperflexion when he struck the ground. He went to the local physician's office for first aid treatment and then returned to St. Paul. On his arrival he noticed that the pain in his right wrist had become much worse, and that movement of his right small finger now caused him severe pain. His past history is essentially negative except for minor injuries incidental to his trade.

Physical examination, except for the injuries sustained in this accident, was negative and irrelevant to the present condition and may be omitted. Examination of the right wrist showed it to be edematous over the ulnar region. The hypothenar eminence was also swollen. There was complete inability to ulnar flex with a ten degree loss of hand flexion at the wrist joint; extension of the hand at the wrist was normal, but caused the patient severe pain. Voluntary attempts to flex or extend the right small finger also caused the patient pain. On palpation of the wrist, finger point tenderness was found over the pisiform bone. It was present to such an extent that the patient requested that the procedure be not repeated. A tentative diagnosis of fracture of the right pisiform was made and the patient was referred for *x*-ray study.

The first plate taken showed no evidence of bone injury, but the clinical evidence was such that the patient was returned to the *x*-ray department for a second plate, with the wrist in the oblique position. The second picture revealed a comminuted fracture of the right pisiform bone.

The hand and forearm were placed in ulnar flexion and dorsal extension by means of an anterior molded splint, and were left in this position for six weeks without passive or active manipulation. Plates were used for comparison during the six weeks of treatment and with the formation of callus the splint was removed. Two days later the patient had a complete

return of function of the right wrist without any pain and was able to return to work.

Healing in the carpal fractures is hindered by the use of active or passive motion. Such treatment may result in pseudo-arthroses or cavity formation in the bone from destruction of the osteoblasts and new blood vessels that have formed in the process of bone repair.

CONCLUSIONS

1. Fractures of the pisiform bone are an unusual type of carpal injury.
2. Pisiform bone fractures may result in disability and should be considered in wrist injuries when dealing with a disability of vague etiology.
3. Treatment by dorsal and ulnar flexion with the use of an anterior molded splint usually gives a good end-result.
4. Improper treatment may result in necrosis and absorption of the bone fragments, thus bringing about permanent disability.

706 Lowry Medical Arts Bldg.,
Saint Paul, Minnesota.

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President's Letter

SOMETHING like a generation ago there came the anti-tuberculosis movement. It proposed to prevent the spread of tuberculosis and to discover and cure incipient cases of pulmonary tuberculosis. The county tuberculosis sanatorium and clinic quickly followed.

At that period the rank and file of the profession, though reasonably proficient in diagnostic and therapeutic skill, foolishly believing the sanatorium staff and its clinic possessed greater ability than themselves, promptly passed their patients along, lost interest in tuberculosis and directly forgot the knowledge and skill once theirs. A little later and the sanatoria and their clinics were swamped with cases in all stages of the disease, both medical and surgical. The defect in the system now became apparent in the lack of doctors in the general field sufficiently skilled to aid in taking care of these cases. Since then this defect has been largely corrected.

Now comes the heart movement. It takes form in the activities of several different organizations more or less closely allied. First comes The American Heart Association seeking to discover the incidence, causes, and prevention of heart disorder. Then comes the Public Health Association seeking to ferret out cases of heart disease, establish clinics for the treatment of same, and to find employment for the partially incapacitated. Other clinics representing lesser organizations are also in process of formation. The two major organizations, in some places at least, seek to link the heart movement with the anti-tuberculosis movement and carry on as a unit activity.

The work of these organizations so far as the study of incidence, etiology, distribution, prevention, economic aspects and emplacement are concerned is most commendable. But when their clinics appear with mass treatment of patients as a part of their work, especially when linked with the field of tuberculosis, they take a step that is ill advised, because it tends to be destructive to the scientific morale of the rank and file of the medical profession, and because a contagious and a non-contagious type of disease are linked together. Carried to its logical conclusions the effect on the profession will be the same as in the anti-tuberculosis movement, and that must not occur again.

This is the point at which the Minnesota State Medical Society steps in. Through its Heart Committee in conjunction with the committee on Hospitals and Medical Education it proposes to take an active and effective part. It proposes to see to it that its members shall have every opportunity to keep abreast of the best and most progressive heart thought and practice of the day. It is determined that its members shall not lag and lose interest in this vital subject, shall not say, "Let George do it."

The understanding of heart disorders is not difficult. The modern classifications based on etiology, structural change and function are most simple and illuminating. They are most stimulating to your interest. They pique your medical curiosity. It is along these lines the two above mentioned committees will proceed. The Heart Committee will formulate details of heart instruction while the Committee on Hospitals and Medical Education will disseminate this knowledge through its extension service.

Lend these committees your most hearty support *to the end that the clinic may not be needed* and to the glorification of yourselves and your profession.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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KARKINOLYSIN AND CANCER

In this number of MINNESOTA MEDICINE there is published an article by Dr. Adolph M. Hanson of Faribault, Minnesota, on the treatment of inoperable cancer with thymic extract. No one who is acquainted with Dr. Hanson can doubt his honesty and sincerity; and his previous work on the parathyroid attests his ability as an investigator. Four cases of cancer treated with thymic extract are reported. Case 1 is clearly an adenocarcinoma of the splenic flexure. This patient lived about four years after surgical removal of the tumor. Death was attributed to pneumonia, but there was no postmortem examination. If a cure was really effected in this case, it might be attributed to surgery.

In Case 2 the clinical diagnosis was carcinoma of the stomach, but no diagnosis can be made on the microphotograph. About one year after the exploratory operation the tumor could no longer be palpated. The patient gained in weight and was in good health when last heard from. The date when the patient was last heard from is unfortunately not given, and she was apparently not examined later than June 12, 1926.

In Cases 3 and 4 the period of observation is entirely too short to determine the efficacy of the treatment.

The author does not state whether any other cases of cancer were treated, and this is a very important omission. Are these four cases the only ones treated, or are they the only ones reacting favorably?

Dr. Hanson makes it clear that he does not claim to have discovered a cure for cancer, but he would have us believe that thymic extract is of value as a palliative treatment. But even this claim is not justified by the case histories that are reported. The clinical history of cancer is very variable. Physicians of long experience know that persons with inoperable cancer often live several years in apparently good health.

It is possible that thymic extract causes necrosis of the central part of large malignant tumors, such as is sometimes observed after treatment with radiation, lead, or Coley's toxin.

Dr. Hanson should be encouraged to continue his work, but much stronger evidence of the value of the treatment must be produced before it can be recommended to the medical profession.

E. T. B.

MORTALITY PREVENTION IN MOTHERS AND INFANTS

The Commonwealth Fund has recently made public the results of a four-year demonstration of the value of preventive medicine in the field of prenatal maternity and postnatal infant care. The following four locations were chosen for the experiment: Fargo, North Dakota; Marion

County, Oregon; Clark County, Georgia; and Rutherford County, Tennessee. The results are striking. The total figures show that the maternal death rate, stillbirths and infant mortality under one month of age were about double in the group that received no medical or nursing care. In some of the localities the death rate in the three groups was several times as great in those who received no supervision. During the first year of life, more than twice as many infants not receiving supervision died, as in the supervised group. The diseases which accounted for the difference were for the most part enteritis, acute respiratory infections and congenital defects.

One may argue that the group which sought medical and nursing care represented the more intelligent group in each community, the mere fact of their seeking or accepting instruction indicating their higher intelligence; and that this group without medical care would have shown a lower mortality. We do not know how important this factor was in this particular demonstration but it does not seem likely that this would have accounted for the marked difference demonstrated.

The importance of preventive medicine is appreciated by most of us. The public is having it more and more impressed upon its individual members. There is evidence from time to time of a lagging in interest on the part of certain members of the profession responsible for this type of work. Examination of well infants, for instance, may in time lose its attraction to the examining physician and he may lose some of his enthusiasm. The importance, however, of proper feeding of the normal infant has become further emphasized in recent years. Proper vitamin content in the diet in maintaining an infant's maximal resistance to infection and in not only preventing manifest rickets but assuring normal dentition makes the subject all the more intriguing.

For those who require figures to be convinced of the results attainable by medical supervision of mothers and infants we would recommend a perusal of the figures submitted in this demonstration.*

*Health Officers' News Letter. Vol. IV, No. 11. Amer. Pub. Health Assn., 370 Seventh Avenue, New York City.

FAIR PLAY

There has lately been considerable criticism of our old friend Dr. Brady, particularly in regard to certain statements made by him in regard to the indications for tonsillectomy, and the best methods of removal of healthy and diseased tonsils. Of course, it is axiomatic that no human, with the possible exception of the above mentioned columnist, is capable of gathering together in one small cranium all the Truth regarding even such a circumscribed field as that of modern medicine, let alone being able to grind it out daily for the consumption of the lay neuro- and hypochondriac. The fact that his statements hold water somewhat over 50 per cent of the time should be a cause for congratulation, rather than censure.

And when one begins to realize the subtle manner in which the financial welfare of the profession is being aided and improved by these articles we should add our heartfelt gratitude to our congratulations.

For instance, there is a well-established belief that tonsillectomies in the adult are becoming scarcer and scarcer as the years pass by, due, of course, to the fact that almost all grown-ups of the present generation lost a greater or lesser amount of their tonsillar tissue during childhood, infancy, or early youth, and, if a clean-cut tonsillectomy was done at that time, the patient is automatically protected against any further interference, and, by the same token, the profession is deprived of its right to do a secondary tonsillectomy.

Contrast this situation with that which we may expect if the good doctor is successful in his propaganda for the "electric" method of tonsil removal. In the first place, the patient can be kept coming to the office for treatments, "burning," "desiccation," "coagulation," and so forth, for almost an unlimited number of visits, and, when he does quit from exhaustion, either physical or financial, there is still plenty of infected adenoid tissue left in the tonsillar fossæ, which, when solidly sealed in by the resulting scar tissue, will almost invariably result in a mass attack on the part of the whole "itis" family, and drive the patient into the arms of a competent surgeon. Naturally, a secondary tonsillectomy through this mass of scar tissue is exceedingly difficult and the operator is certainly

entitled to a greater fee than can be honestly demanded for removing virginal tonsils.

The writer has had this condition forcibly brought to mind in two cases of recent date, whose histories are almost identical. Enlarged tonsils, and occasional sore throat. Tonsillectomy had been advised. The possessors were saved from this ordeal by the timely perusal in the morning paper of an article by our good friend, the doctor, and immediately took advantage of the "new electrical" method. After an inordinate loss of time and considerable expense, healing was at last allowed to take place, and, once solidly healed, both patients came down with a subacute arthritis which persisted until the infected foci were removed. These patients are now well, and happy to have safely passed through such a serious ordeal, and can now recall and discuss their symptoms with other sufferers, to their hearts' content.

Space will not permit discussion of the dictum that 70 per cent of all removed tonsils should have been left alone. Certainly if that high a proportion of tonsils *are* unaffected, no very harmful results can accrue from the method of electro-coagulation. The patient is no worse off than before, and his doctor is that much ahead. At the same time it has functioned as a therapeutic test which works out as follows: If the patient is no better nor no worse than before, then he is one of the 70 per cent whose tonsils did not need to be removed. If he develops symptoms of absorption following the incarceration of the tonsillar bacteria, it is definite proof of tonsillar infection and an indication for tonsillectomy. Let us be fair—and slow to criticize, for who knows when he may "bite the hand that feeds him"?

M. W. W.

HISTORICAL COMMITTEE

Will not some of you who read this stuff help stimulate the gathering of material for our History of Medicine in Minnesota? Contribute something so I shall not have to think up new things from month to month to publish here. Our own knowledge of early medical men and events is largely confined to our own city and you may become tired of it. We thought the first published medical communication came from Minnesota in 1853 and J. H. Murphy contributed a note on abscess of the breast in 1854. A few months ago, however, we found an article written in 1814 and published in 1816 by the first medical officer at Ft. Snelling, and a still shorter time ago we picked up unexpectedly Vol. I, No. 4 (January, 1859) of the "Minnesota Homœopath" published in St. Paul. We had always thought Dr. A. J. Stone's Northwestern Medical and Surgical Journal (1870) the first. After looking over the Homœopath, however, we concluded it hardly merits the name of a journal, but nevertheless it gave us an historical, not hysterical, thrill.

Write Dr. H. M. Workman, Tracy, Minnesota, if you know anything interesting. The Committee will appreciate it.

J. M. A.

THE COMMITTEE ON FOODS.

The need of some body to express judgment of food products and food advertising, in the same way that the Council on Pharmacy and Chemistry considers medical preparations, has become apparent. The Council has therefore created a special committee on foods. The manufacturers of food products, distributors and all others interested in the promotion of natural food substances or of modified foods, for which claims are made in relation to the promotion of good health, will be asked to submit to the committee the products and the advertising material used in advancing their sale. If a product is found acceptable by the committee, advertisements of it will be permitted in the publications of the American Medical Association, the product will be listed in the book on foods similar to New and Non-official Remedies, and the manufacturers will be permitted to use a symbol indicating that the product has been accepted by the committee for listing in the book of foods. If the product cannot reach the standards set forth, a report will be published as is done for drug products, and advertising of the preparation will not be permitted in the publication of the American Medical Association. The work of the Committee on Foods should do much to carry still further the message of good hygiene and of scientific medicine. In beginning this work, the Council on Pharmacy and Chemistry again asks the complete support of the medical profession. Only by the sincere coöperation of the medical profession with the committee can it achieve the prestige necessary to complete attainment of its objects. (Jour. A. M. A., October 12, 1929, p. 1147.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

State Medicine

An extremely interesting prospectus for a new project in the field of public health to be undertaken this year by the Commonwealth Fund has been sent to every state health officer in the United States and the deans of the medical schools.

This Commonwealth Fund was established ten years ago by the Steven V. Harkness fortune of Rockefeller Oil affiliations.

Education and child welfare were its original objects. But a recently established division of public health with Dr. William J. French as director has had the following proposal outlined in its main points below, as sequel.

From one point of view this fund proposes to show state health departments how they make detection and cure of disease a state function. It proposes, also, to assist in paying the bill.

Is it, in other words, just another very important step toward the establishment of "State Medicine"?

The two related lines of public service planned by the fund fall under two heads, "public health activities" and "medical service." They are to be put into effect in two or possibly three states where health departments desire and request it.

I. Public Health Activities

A. The establishment, under direction of the state health department, of a field unit for the purpose of organizing and improving county or district health service in rural areas.

B. Assistance, through the state health department, to two rural counties or districts in the state for the purpose of establishing complete health units to render public health service according to the best current standards. The minimum unit which will be considered for such assistance will include a full-time health officer, a sanitary officer, two public health nurses, and one clerk. Larger units are to be preferred.

II. Medical Education

A. Assistance to a Grade A medical school which sends a reasonable percentage of its graduates into the state in question: to develop courses in preventive medicine, and to provide special facilities and opportunities for postgraduate work by rural physicians. While this school will presumably be located in the state selected, a school elsewhere may be designated if it customarily draws students from the state in large numbers.

B. The establishment at the same medical school of a scholarship or loan fund for the use of not less than five students from the state in question who agree to go into rural practice in that state for a stipulated period after graduation.

C. The establishment of fifteen postgraduate fellowships each year for physicians in each state selected for the public health activities mentioned above, as a contribution toward raising the standards of rural medical practice. Five fellowships will be awarded in each of the counties or districts where health units are established, and five in the state at large. Appointments will be made by the Commonwealth Fund.

III. Public Health Nursing

A. The establishment of one or more postgraduate fellowships for public health nurses actually employed in the state selected.

IV. Health Education

A. Assistance to the state normal school, or other teacher-training institution, in providing facilities for the training of teachers in the purposes and methods of health education.

B. The establishment of one or more fellowships in health education to be awarded each year to teachers employed in the schools of the districts where health units are established under this plan.

This plan in its entirety is intended to be flexible and experimental. No fixed time-limit has been set for its operation. The staff of the Division of Public Health will endeavor to assist in correlating the educational projects in each state with the public health activities to the end that progress may be consistent and concrete.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over State WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of February will be as follows:

February 5, 1930—Pork worm disease
February 12, 1930—Glaucoma
February 19, 1930—Feeding the problem child
February 26, 1930—Inflammation of the ear

WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION

A conference of pretentious dimensions, the function of which will be to consider the various phases of child health, has been put under way by President Hoover. Financed by contributions from the great foundations and headed by Dr. Ray Lyman Wilbur, Secretary of the Interior, the conference is to be national in scope. Instead of consisting of a conference meeting of two or three days' duration, a number of meetings in addition to those already held in Washington, New York, Philadelphia and Boston will be held over a period of one to two years.

Committee appointments of those prominent in the profession, in public health work, nursing, institutional work, and so forth, have been made and every phase of the subject of child welfare will be included in the program. This comprises a consideration of factors influencing the child from the standpoint of heredity, prenatal care, birth, nutrition in infancy and childhood, child psychology, etc.

The following committee and sub-committee chairmen have been appointed:

SECTIONS

Section I. Medical Service, *Samuel McC. Hamill, M.D.,* Philadelphia, Pa.
- A. Growth and Development, *Kenneth D. Blackfan, M.D.,* Boston, Mass.
- B. Prenatal and Maternal Care, *Fred L. Adair, M.D.,* Chicago, Ill.
- C. Medical Care for Children, *Philip Van Ingen, M.D.,* New York City

Section II. Public Health Service and Administration, *Hugh S. Cumming,* Surgeon-General, Washington, D. C.
- A. Public Health Organization, *E. L. Bishop, M.D.,* Nashville, Tenn.
- B. Communicable Disease Control, *George H. Bigelow, M.D.,* Boston, Mass.
- C. Milk Production and Control, *H. A. Whittaker, C.E.,* Minneapolis, Minn.

Section III. Education and Training, *F. J. Kelly, Ph.D.,* University of Idaho
- A. The Family and Parent Education, *Louise Stanley, Ph.D.,* Washington, D. C.
- B. The Preschool Child, *John E. Anderson, Ph.D.,* Minneapolis, Minn.
- C. The School Child, *Thomas D. Wood, M.D.,* New York City
- D. Vocational Guidance and Child Labor, *Anne S. Davis,* Chicago, Illinois
- E. Recreation and Physical Education, *Henry Breckenridge,* New York City
- F. Special Classes, *Chas. S. Berry, Ph.D.,* Ann Arbor, Mich.

Section IV. The Handicapped: Prevention; Maintenance; Protection, *C. C. Carstens,* New York City
- A. State and Local Organizations for the Handicapped, *Mrs. Kate Burr Johnson,* Raleigh, N. C.
- B. Physically and Mentally Handicapped, *William J. Ellis,* Trenton, N. J.
- C-1 Socially Handicapped — Dependency, *Homer Folks,* New York City
- C-2 Socially Handicapped—Delinquency, *Frederick P. Cabot,* Boston, Mass.

RICE COUNTY MEDICAL SOCIETY

A meeting of the Rice County Medical Society was held in the Faribault Clinic Rooms December 11, 1929. In addition to twenty-five members of the society, Dr. C. B. Wright, Minneapolis; Dr. E. A. Meyerding, St. Paul; Dr. W. D. Beadie, Cannon Falls; Dr. Emerson, of Northfield; and Dr. D. E. McBroom, Cambridge, were present.

The meeting was called to order by the President, Dr. J. M. Murdoch, and after the minutes of the previous meeting were read and approved, and other routine business disposed of, Dr. Adoph M. Hanson of Faribault read a paper entitled "A Report of Four Cases of Inoperable Cancer Treated by Intramuscular Injections of Karkinolysin."

Dr. Hanson, after completing his pioneer work on the parathyroid gland and its calcium-raising hormone, has spent several years of research work and experimentation on the cause and treatment of cancer, and has finally reached that stage when it was deemed advisable to reveal his results thus far, for the first time, to the members of the society, in order that clinical experimental work may be carried out on a larger scale by other investigators.

Dr. Hanson does not wish to be understood as having a specific cure for malignancy, but Karkinolysin evidently has a solvent action in the cases reported of sufficient interest to report his findings to the profession.

Dr. Hanson received generous expressions of commendation for his achievement thus far in this direc-

tion, by Drs. C. B. Wright, Ex-president of the Minnesota State Medical Association; E. A. Meyerding, Secretary of the Minnesota State Medical Association; W. D. Beadie, Superintendent of Cannon Falls Sanitarium; D. E. McBroom, Superintendent State Epileptic Colony at Cambridge; and members of the Rice County Medical Society.

Dr. Murdoch, President, in behalf of Rice County Medical Society, thanked Dr. Hanson for his interesting message, and assured him the full support and best wishes of the society in his future work.

There being no further business the meeting stood adjourned.

C. J. Plonske, M.D., *Secretary.*

CONFERENCE OF SECRETARIES

Seventy-five physician-delegates representing 28 different district and county medical societies registered for the annual conference of secretaries of the Minnesota State Medical Association, held Jan. 11, 1930, at the Athletic Club in St. Paul. Dr. F. C. Schuldt, president of the Ramsey County Medical Society, welcomed the delegates.

High lights on the program of the conference included a lively discussion of the high cost of hospital care and its causes; the relation of the medical association to the current heart disease campaign; and the safe storage of inflammable *x*-ray film.

Dr. I. C. Riggin, New York, executive secretary of the American Heart Association, outlined the proposed program of the national association for the conference. Dr. N. O. Pearce, Minneapolis; Dr. F. A. Willius, Rochester; Dr. O. E. Locken, Crookston; Dr. S. A. Slater, Worthington; and Dr. J. F. Borg, St. Paul, discussed the local aspects of the campaign.

Dr. Pearce, Dr. William A. Meierding of New Ulm, and Paul Fesler, superintendent of the University Hospital, spoke on the community hospital, its organized staff and its costs.

Fire prevention officials of Minneapolis and a representative from the Eastman Kodak Company explained methods of protection for storage of the inflammable nitro-cellulose film and urged the secretaries to substitute the acetate safety variety of film for the inflammable nitro-cellulose in *x*-ray work. Dr. S. H. Boyer, Duluth; Dr. C. G. Sutherland, Rochester; and Dr. C. B. Wright, Minneapolis, related their experience with both types of film and with film storage.

Mrs. J. D. Lyon, president of the Women's Auxiliary, discussed the activities of her organization.

Interesting aspects of legal medicine and malpractice insurance encountered by F. M. Brist, St. Paul attorney for the State Board of Medical Examiners, with discussion by Dr. W. H. Hengstler, St. Paul, and Dr. H. M. Johnson, Dawson, and a review by Dr. F. H. Magney, Duluth, of the successful lay health education program carried on by St. Louis County Medical Society, also had a place on the day's program. Dr. George Earl, St. Paul, indicated the inevitable place of the practising physician in public health programs of the future.

RED RIVER VALLEY MEDICAL SOCIETY

The following officers were elected by the Red River Valley Medical Society at their annual meeting December 19, 1929:

Dr. C. M. Adkins.....Grygla.....*President*
Dr. Halvor Holte.....Crookston.....*Vice President*
Dr. C. L. Oppegaard.Crookston.....*Secretary-Treasurer*

Dr. Arthur Kahala, of Crookston, was elected censor for three years.

The following members were elected to represent the society at the state meeting for 1930: Dr. H. M. Blegen, Warren, first delegate; Dr. I. G. Wiltrout, Oslo, first alternate; Dr. O. E. Locken, Crookston, second alternate; Dr. J. F. Norman, Crookston, second alternate.

HENNEPIN COUNTY TUBERCULOSIS ASSOCIATION

The Hennepin County Tuberculosis Association held its twenty-seventh annual meeting in the Citizens Aid Building, Minneapolis, Thursday evening, January 30.

The Board of Directors met preceding the dinner to elect new officers, and during the dinner election of new Association members and new Board members was made.

Speakers, each of whom contributed to the picture of "How Our Community Is Meeting Its Tuberculosis Problem," included:

Dr. H. A. Burns, superintendent, State Sanatorium; Dr. E. S. Mariette, superintendent, Glen Lake Sanatorium; Dr. Jay A. Myers, Chief of Staff, Lymanhurst Clinic and School; Dr. F. E. Harrington, Health Commissioner, Minneapolis; Dr. Walter J. Marcley, Veterans Bureau; Dr. N. O. Pearce, president, Hennepin County Tuberculosis Association; Dr. H. L. Ulrich, chairman, Heart Committee, Hennepin County Tuberculosis Association; Dr. E. A. Meyerding, executive secretary, Minnesota Public Health Association.

TREPARSOL

Treparsol differs from the better known acetarsone in that it has a formyl group in place of the acetyl group of acetarsone. Its oral use, as with acetarsone, in the treatment of syphilis is not supported by adequate evidence. Treparsol has not been accepted by the Council on Pharmacy and Chemistry. (Jour. A. M. A., December 7, 1929, p. 1830.)

COMMUNICATION

DEPARTMENT OF COMMERCE
AERONAUTICS BRANCH
WASHINGTON

December 21, 1929.

To the Editor:

The attached resolutions were passed by the American Medical Association at its stated assembly held at Portland, Oregon, in July, 1929. It is believed that these resolutions are of sufficient interest in view of the rapidly increasing number of physicians designated as Medical Examiners to warrant publication in your journal.

You may be interested to know that all applicants for federal pilot licenses, either for flying or for training as pilots, must pass physical examinations before physicians designated by the Secretary of Commerce. They must likewise be re-examined periodically. These examinations cover a rather detailed examination of the eyes, a brief examination of the ear, nose and throat, equilibrium, a general physical examination, and a detailed examination of the nervous system. There are now about 750 Medical Examiners so designated throughout the country. All these examinations are reviewed in Washington, where the applicant is finally certified as qualified or disqualified for the grade for which he has applied.

Very truly yours,
L. H. Bauer, M.D.,
Medical Director.

Whereas, The Aeronautics Branch, Department of Commerce, has organized a medical service for the physical examinations of civil pilots and prospective pilots, in the interests of safety; and

Whereas, The physical standards adopted are in keeping with those adopted universally, and have reduced aircraft accidents from physical causes to a minimum; and

Whereas, The department has required these examinations to be made only by designated physicians in the interest of uniformity and control and in accordance with the custom adopted for the Army and Navy and in other countries; and

Whereas, The selection of examining physicians by the department has been based on training as flight surgeons or its equivalent, or on group examinations by specialists, a high standard of examination has resulted; and

Whereas, The department requires that all examiners hold the degree of Doctor of Medicine, be licensed to practice medicine under the laws of their respective states, and further requires that the appointees be recognized as ethical practitioners in their respective localities, thereby supporting the high standards advocated by this Association, be it

RESOLVED, That the American Medical Association at its stated assembly in 1929 endorses the medical work of the Department of Commerce, its methods of physical examination and its method of selection of medical examiners, and urges that the same high standards be continued and offers the support of the American Medical Association in furthering the specialty of aviation medicine; and be it further

RESOLVED, That a copy of this resolution be sent to the President of the United States, the Secretary of Commerce, and the Secretary of each state medical society.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council of Pharmacy and Chemistry:

E. Bilhuber, Inc.
Lenigallol-Zinc Ointment

Cutter Laboratory
Scarlet Fever Streptococcus Antitoxin-Cutter

Mead Johnson & Co.
Mead's Viosterol in Oil 100 D

H. K. Mulford Co.
Ampules Sodium Cacodylate-Mulford, ¾ grain, 1 c.c.
Ampules Sodium Cacodylate-Mulford, 3 grains, 1 c.c.
Ampules Sodium Cacodylate-Mulford, 5 grains, 1 c.c.

Winthrop Chemical Co., Inc.
Tablets Tutocain No. 6

The following article has been exempted and included with the List of Exempted Non-medicinal Articles (New and Non-official Remedies, 1929, p. 485):

Child Welfare Guild, Inc.
Bite-X

TRUTH ABOUT MEDICINES

Gelatin Compound Phenolized-Mulford.—A mixture composed of gelatin, zinc oxide, glycerin, and water, containing 1.5 per cent of phenol. It is used in the preparation of bandages to cover chronic ulcers, unhealed secondary burns, and in the preparation of pressure bandages for varicose veins, when surgical treatment is not necessary. H. K. Mulford Co., Philadelphia.

Diphtheria Toxoid-Mulford, 30 c.c. Vial.—Diphtheria Toxoid-Mulford (New and Non-official Remedies, 1929, p. 369) is also marketed in packages of one 30 c.c. vial. H. K. Mulford Co., Philadelphia.

Typhoid-Paratyphoid Prophylactic, Hospital Packages.—Typhoid-Paratyphoid Prophylactic (New and Non-official Remedies, 1929, p. 379) is also marketed in hospital size packages containing ten complete immunizations. Cutter Laboratory, Berkeley, Calif.

Ampule Solution Silver Nitrate 1 Per Cent-Cutter.—Solution silver nitrate 1 per cent, approximately 0.2 c.c., contained in ampules composed of beeswax. They are used for the prevention of ophthalmia neonatorum. Cutter Laboratory, Berkeley, Calif.

(Continued on Page 129)

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a patient, a nine year old boy, who complained of intermittent aching pain in the right shoulder. There was no history of injury. Physical examination was negative except for slight tenderness in the upper end of the humerus. There was no limitation of motion of the shoulder joint. *X*-ray examination was thought to show a separation of the epiphysis of the humerus. A cast was applied and kept on for several weeks. When it was taken off, a second *x*-ray examination revealed practically the same change as was seen in the first. In the interval, however, he had been entirely relieved of all symptoms. This followed in a few days after the cast was applied, and when the cast was taken off he said that his arm was all right and felt as well as ever.
   Was there a true separation of the epiphysis? Should the cast have been left on longer?
   Answer.—The fact that the two *x*-ray plates were the same and all symptoms were relieved probably indicates no epiphyseal separation was present. The relief of pain by the use of a cast suggests that there was an epiphysitis, an arthritis, or some other type of inflammation of the shoulder joint. No further treatment is necessary.
2. *Question.*—I am desirous of getting information about a drug known as "Yatren." What is its value in the treatment of any form of colitis? Is free purgation following two to four pills four times daily a concomitant of its use, or more likely related to the colitis? Is it indicated in amebiasis? Is it merely empirical, or is it accepted?
   Answer.—"Yatren" is a drug which is specific for the destruction of amebæ. Its use in other forms of colitis is not recommended. The continuation of the colitis after the use of "Yatren" probably indicates that the lesion was due to some other factor. The drug is recognized and widely used. Have you examined the stools for amebæ, or is the patient suffering with nonspecific ulcerative colitis or a form due to the normal flora of the bowel? If no amebæ are present and the colitis is of the nonspecific type, it is doubtful if "Yatren" would have any effect.
3. *Question.*—I saw a patient not long ago with a red edematous mass which started with the left trapezius muscle and extended over the clavicle down the chest to the fourth rib and straight across and up the other clavicle to the right trapezius muscle. The spaces above and below both clavicles were evenly filled with this edema and were very tender to touch. Patient was clear mentally, and had no chills or sweats. Morning temperature ranged from 100 to 101; afternoon, 102. Leukocytes 20,000. Pulse 90 to 102.
   When first seen, patient had no edema but complained of intense pain. She was not able to stand it without morphine. Shortly after this, the edema started and spread as described, but did not affect either the neck or shoulder joints. She admitted that she had cut herself slightly a few days before while butchering hogs. Had used no antiseptic as it did not bleed. This area had become very tender; was covered with a bleb when I saw it. Applications of cold were made to the edematous part, which reduced it considerably. I thought of the possibility of erysipelas and gave the serum, with the resulting drop of temperature. Condition remained fairly stationary for a day or two, and then recurred. Should this lesion be opened by multiple incisions?
   Answer.—The most probable diagnosis is cellulitis. No pus is present in the more virulent forms. The most one can expect after opening is a little thin, cloudy fluid, but even this may be absent. A smear or culture of the region would reveal the causative organism. Wide and free drainage might help.
4. *Question.*—I have a patient, a middle aged woman, who has been sick for the past three weeks. She complains of sharp epigastric pain, nausea and vomiting, and moderate prostration. She has no chills, fever, or sweats. There is no jaundice or other signs of obstruction of common bile duct. She is an obese individual and has never had trouble like this before. An *x*-ray of the stomach and duodenum shows no signs of ulcer. An *x*-ray of the gall-bladder region is also negative. The pain, which is very sharp, usually comes on about three or four o'clock in the morning and interferes with sleep. The first few nights, I think, she had some relief from food. I have had her on ulcer management, but this does not seem to help her any. The patient also complains of some pain in the daytime, but this is not as marked as the night pain. She vomits a great deal with the attacks.
   What are the other diagnostic possibilities and what should be done to relieve the condition?
   Answer.—In an obese woman, the possibility of para-esophageal hernia should be considered. An article on this subject appeared in a recent number of MINNESOTA MEDICINE. Hernia at the esophageal hiatus cannot be diagnosed clinically. As a rule, it is necessary to make an *x*-ray examination with the patient in the recumbent position. This allows the stomach to slip up in the opening and may reproduce the attacks the patient describes. Pancreatitis is another possibility. Swelling of the pancreas might be visualized if the duodenum is widely separated. Clinical diagnosis of pancreatitis is rather vague and cannot be made with any certainty. I would advise you to investigate the possibility of diaphragmatic hernia. If this is present, it is possible to operate on the patient and sew up the hernial opening.

OBITUARY

Paul Frederick William Wipperman

1888-1930

Dr. Paul Frederick William Wipperman, well known to the profession in Minnesota, died on the morning of January 2, 1930, following a month's illness due to a streptococcic infection. At the time of his death he was superintendent of the Touro Infirmary at New Orleans.

Dr. Wipperman was born November 26, 1888, on his grandfather's farm in Warren County, Missouri, the son of a Methodist minister. He received his degree of A.B. from the Central Wesleyan College at Warrenton, Missouri, and then worked his way through the medical school at the University of Minnesota, where he graduated in 1913. While at the medical school he played on the basketball team for three years and captained a championship team his Senior year.

After serving his internship in the Minneapolis General hospital Dr. Wipperman began practice at Albany, Minnesota. In 1915 he became medical examiner for the Twin City Rapid Transit Company and in 1917 enlisted as Lieutenant in the Medical Corps, which took him to Fort Riley and San Antonio. Upon being mustered out of the army he organized the Veterans' Service Clinic in Minneapolis and in 1922 was appointed commanding officer of the U. S. Veterans' Hospital No. 30 at St. Louis. From 1923 to 1928 Dr. Wipperman superintended the Decatur and Macon County hospital in Illinois and for the past year has been the head of the Touro Infirmary in New Orleans.

Dr. Wipperman is survived by his father and mother; one sister, Mrs. Ernest Sears; his wife, formerly Miss Erna Snell of Fairfax, Minnesota; and a son, Frederick.

H. N. Hovde

1861-1929

Dr. H. N. Hovde, aged 68, prominent practising physician at Duluth, Minn., died suddenly from a heart attack Dec. 24, 1929, while attending a patient.

Born in Norway, Dr. Hovde studied medicine at the University of Oslo, and in 1889 came to the United States. He settled and practised in Vermilion and Sioux Falls, S. D. In 1900 he moved to Duluth, where he had been practising since.

For twelve years, until 1927, Dr. Hovde was a member of the St. Louis county poor commission, and took an active part in this work. He was also a member of the St. Luke's hospital staff and of the local and state medical organizations.

Surviving him are his wife; two daughters, Mrs. Arnold Berg, Duluth, and Miss Valborg Hovde, who teaches school at Hibbing, Minn.; one son, Dr. Rolfe Hovde, of Winthrop, Minn.; and grandchildren.

A. G. Moffatt

1865-1929

Dr. A. G. Moffatt, of Howard Lake, Minn., died at his home Dec. 18, 1929. Dr. Moffatt had practised in Howard Lake for 32 years. He was for several years president of the Wright County Medical Society, was a member of the State Medical Association and the board of medical examiners. During the world war he held the rank of captain and was stationed at Ford Sheridan.

Dr. Moffatt was 64 years old. He is survived by his widow; two daughters, Mrs. E. W. Ryley of Honolulu, and Mrs. W. T. Campbell of Minneapolis; and two sons, A. M. Moffatt of Chokio, and Dr. R. H. Moffatt of Morris, Minn.

TRUTH ABOUT MEDICINES

(Continued from Page 127)

Merthiolate—Sodium Ethylmercuri Thiosalicylate.—Merthiolate contains from 49.15 to 49.65 per cent of mercury in organic combination. Merthiolate is a potent germicide for spore-bearing and non-spore-bearing bacteria. It is used for sterilizing tissue surfaces. It does not precipitate with serum proteins. Merthiolate is much less toxic than mercuric chloride. Merthiolate is supplied in the form of merthiolate solution 1:1,000, containing 1 gram of merthiolate in 1,000 c.c. of water, buffered with 1.4 Gm. of sodium borate in 1,000 c.c. and containing sodium chloride to make the solution approximately isotonic. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., December 7, 1928, p. 1809.)

Polyanaerobic Antitoxin.—An anaërobic antitoxin (New and Non-official Remedies, 1929, p. 346) prepared by immunizing horses with the toxins of *B. tetani, B. Welchii, Vibrion septique* and *B. oedematiens.* It is marketed in bottles containing 100 c.c., each 100 c.c. containing at least 5,000 units of tetanus antitoxin, 75 units of Welch bacillus antitoxin, and sufficient antitoxin to neutralize 50,000 minimum lethal doses of *Vibrion septique* toxin and 100,000 minimum lethal doses of *B. oedematiens* toxin. Cutter Laboratory, Berkeley, Calif.

Normal Horse Serum Without Preservative.—A normal horse serum (New and Non-official Remedies, 1929, p. 344) marketed in packages of one vial containing 100 c.c. H. K. Mulford Co., Philadelphia.

Sulpharsphenamine-De Pree, 0.9 Gm. Ampules.—Each ampule contains sulpharsphenamine-De Pree (New and Non-official Remedies, 1929, p. 71), 0.9 Gm. De Pree Chemical Co., Holland, Mich. (Jour. A. M. A., November 23, 1929, p. 1649.)

Thompson's Maltose and Dextrin.—A mixture containing maltose, 51 per cent; dextrins, 45 per cent; sodium chloride, 2 per cent; and moisture 2 per cent. On the claim that maltose is more readily assimilated than other forms of sugar, Thompson's maltose and dextrin is proposed to supplement the carbohydrate of cow's milk or of water modifications of cow's milk. Thompson's Malted Milk Co., Inc., Waukesha, Wis. (Jour. A. M. A., December 21, 1929, p. 1971.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of December 11, 1929

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 11, 1929. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. C. N. McCloud. There were 49 members present.

Minutes of the November meeting were read and approved.

The Secretary read the Annual Secretary's and Treasurer's reports. A motion was carried that they be accepted. Dr. Drake included in his Secretary's report his resignation as Secretary-Treasurer. A motion was carried that a rising vote of thanks be given to Dr. Drake for his faithful and efficient service to the Academy.

Dr. Geo. D. Head read, for Dr. J. W. Bell, the following report of the Committee appointed to draw up a memorial to Dr. Louis A. Nippert, and a motion was carried that this be spread upon the minutes of the Academy and a copy sent to Dr. Nippert's family:

Louis Albert Nippert, 1860-1929. The Minnesota Academy of Medicine is again called upon to mourn the death of one of its oldest and most revered members, Louis Albert Nippert.

He was born in Basel, Switzerland, April 14, 1860. His father was a Methodist clergyman who at one time was President of the Methodist Theological Seminary at Frankfort-on-Main, Germany. His early education was carried on in the schools of Switzerland and preparatory to his college course he took work in the gymnasium and polytechnical high school at Karlsruhe, Germany. His parents later came to this country and located in Cincinnati, Ohio, where he completed his academic education.

Dr. Nippert began his professional studies in 1880 at Miami Medical College, Cincinnati, graduating in the class of 1883. After a year spent as an intern in the Cincinnati Hospital and a year as resident physician, he took post-graduate work in Paris and Vienna and then located in general practice in Minneapolis in April, 1885.

He was married in June, 1888, to Miss Mary Rauen. A daughter, Lillian, and a son, Rauen Louis, were born of this union, the son dying in 1909. Surviving him are his wife; his daughter, Mrs. E. F. Zelle; four brothers, Dr. Henry T. Nippert of St. Paul, Dr. Edgar Nippert of Los Angeles, Judge Alfred Nippert and Herman Nippert both of Cincinnati; and three sisters, two living in Cincinnati and one in Seattle.

Dr. Nippert died from a cranial fracture sustained while riding his horse, November 6, 1929.

Beginning his professional career as a general practitioner he developed those fine qualities of heart and mind born of the hard and trying experiences of a pioneer doctor. To a large clientele, many of his patients being poor or in moderate circumstances, he gave the best that was in him at all times without thought of his own comfort or health.

His later years were devoted to consultation practice in Internal Medicine. His large experience, analytical mind, splendid medical training, and cheering personalty admirably fitted him for this specialty. The outstanding qualities of his character were his loyalty to the high ideals of his profession and his faithfulness to duty. A number of times the profession had honored him without self-seeking on his part. He was elected President of this Academy in October, 1912, and took office in November, 1912. His Presidential Address was entitled "The Etiology, Diagnosis and Treatment of Acute Infections of the Pleura and Lungs." He was also elected to the presidency of the Hennepin County Medical Society.

He was appointed Instructor in Clinical Medicine in the Medical School of the University of Minnesota in 1898, and was made Professor of Clinical Medicine in 1902. Many of his old students, some of them members of the Academy, will remember the practical character of his instruction, well-grounded in a thorough knowledge of anatomy and pathology. He served the University and the state as a medical teacher until the reorganization of the faculty in 1913, at which time he resigned.

In 1907 Dr. Nippert again studied in Europe and spent much time in the hospitals and clinics.

He was a charter member of the Minnesota Society of Internal Medicine, and, in spite of the fact that a physical infirmity made it difficult for him to do so, he was always present at the all-day sessions of this Society.

The Staffs of Abbott Hospital and Hillcrest Hospital were honored by his name upon the list of their active membership.

The following is a bibliographic list of his contributions to medical literature:

Septic Endocarditis. Northwest Lancet, 1904, Vol. 24, p. 39.

General Considerations in the Treatment of the Earlier Stages of Pulmonary Tuberculosis. Northwest Lancet, 1905, Vol. 25, p. 183.

Diagnosis and Therapeutics of Pneumonia. Medical Brief, St. Louis, 1907, Vol. 35, p. 179.

Observations on the Methods of Diagnosis in some of the Clinics of Germany. Jour. Minn. Med. Assn., 1908, Vol. 28, p. 197.

The Diagnosis and Treatment of Incipient Tuberculosis. Jour. Minn. Med. Assn., 1908, Vol. 28, p. 508.

The Etiology, Diagnosis and Treatment of Acute Infections of the Pleura and Lungs. Journal-Lancet, 1913, Vol. 33, p. 249.

Prognosis and General Management of Pneumonias. Journal-Lancet, 1921, Vol. 41, p. 66.

The Committee: J. W. Bell
Geo. D. Head
S. Marx White.

The annual election was held at this meeting, and the counting of the ballots showed that the following

members were unanimously elected as officers for the year 1930:

President—Dr. Gustav Schwyzer (Minneapolis).

Vice-President—Dr. James S. Gilfillan (St. Paul).

Secretary-Treasurer—Dr. R. T. LaVake (Minneapolis).

Dr. J. M. Armstrong (St. Paul) showed several original first volumes of medical magazines published in the United States:

1. In 1797 the first scientific periodical publication and the first medical journal was published in North America. This is a copy of Volume I of that journal "The Medical Repository" published in New York (1797-1824). Volume I contains nothing of particular value to us at the present time and much of the material in it is not strictly medical. You may look it over and judge for yourselves. However, it must have filled "a long-felt want" as Volumes I and II were reprinted in 1802 and again in 1804. This particular volume I hand you is the 1804 reprint. Many interesting things might be said about its Editor but time does not permit.

2. This second volume is the first volume of "The Philadelphia Medical and Physical Journal" which was published from 1804 to 1809. There are one or two curious items in it. Whether it can be called the second medical journal published in the United States, I do not know, as the Philadelphia Medical Museum was published also in 1804 and ceased in 1811. I have no copy of this latter journal.

3. This third volume is the first volume of the "New England Journal of Medicine and Surgery" published in Boston in 1812. We are fortunate in having a full set of twenty-seven volumes in our Ramsey County Medical Library. If you will look over the table of contents you will find the names of many of the notable medical men of Boston among the contributors.

4. This fourth volume is Volume I of "The American Medical Recorder" published in Philadelphia in 1818. It continued publication until 1829. There are some quite interesting articles in this volume and also in the succeeding volumes but I cannot take the time to show the other volumes though we have a run of the first seven volumes.

5. This fifth volume is the first volume of "The Philadelphia Journal of the Medical and Physical Sciences" published in 1820, Nathaniel Chapman, editor. I call your attention to the title page where you will find printed the following quotation from the Edinburgh Review, No. LXV: "In the four quarters of the globe, who reads an American book or goes to an American Play? or looks at an American picture or statue? *What does the world yet owe to American Physicians or Surgeons?* (The italics are Chapman's, not Sidney Smith's.) Chapman was an Edinburgh graduate himself but was a thorough Philadelphian also and this statement was galling. He would start a medical journal and show the world the injustice of this statement. The journal continued under this name until 1827, when Isaac Hays, who had been assistant editor for a year, became editor. Hays thought the Journal should be more national in character and changed its name to "The American Journal of the Medical Sciences," under which name it is now conducted and well known to all of you as one of the foremost medical periodicals of the world. There is no doubt Chapman made good when he challenged Sidney Smith.

I might say that Sidney Smith was hardly correct, as Dorsey's Surgery was in 1818 reprinted in Edinburgh for use as a textbook in that University. John Syng Dorsey wrote the first American treatise on Surgery, published in 1813. I will show it to you some other time. Isaac Hays edited this great journal from 1826 to 1869 and after his death his son, I. Mimis Hays, was editor until 1901. Thus for 75 years it was "Hays' Journal" and so known to many of the past generation. With the exception of the Edinburgh Medical and Surgical Journal, the American Journal of the Medical Sciences is the oldest medical periodical in the world. The whole history of American Medicine and the progress of Medicine during its life may be found in its pages.

6. This collection of papers, while not strictly copies of a medical journal, are of intense interest and a literary curiosity, as the "Rush-Light" was published weekly in New York for the sole purpose of heaping abuse and ridicule on Dr. Benjamin Rush of Philadelphia. It was published by Wm. Cobbett, who wrote sharp articles under the name of Peter Porcupine. Cobbett was the proprietor of the "Porcupine Gazette" of Philadelphia, published as a Democratic organ under the patronage of Thomas Jefferson to discountenance the Federalist party, which was strong in Pennsylvania. Porcupine, in his abuse of Rush, went a step too far and, instead of confining his remarks to Rush's political activities, abused him as a physician. Rush sued Cobbett for libel. The suit being tried before a Court with Federalist leaning, a verdict of $5,000 was obtained —an enormous sum in those days. Cobbett fled to New York and retaliated by publishing the "Rush-Light." Five weekly numbers were gotten out. Early in 1800, when the Federalist party made it too hot for him even there, he went to London and printed two more copies. I show you the copies printed in New York and hope at some time to secure the remaining numbers. Cobbett readily obtained employment as a political pamphleteer in England and was later elected to Parliament. (See McMaster's History of the People of the United States, and the Encyclopedia Britannica, under Cobbett.)

Last year the Academy decided to award a medal at its annual meeting to the member making the most noteworthy contribution to its program during the year. The special Awarding Committee, consisting of Drs. Colvin, Gilfillan and Bouman, this year decided to award the medal to Dr. Arnold Schwyzer of St. Paul.

Dr. A. R. Colvin (presenting the medal for the Committee): Perhaps it is quite unnecessary, in presenting this medal to one whom you all know so well, to say more than that it gives us all great pleasure to present it. It may, however, be well to say that the

decision to award it to Dr. Arnold Schwyzer was enthusiastically unanimous as to the Committee and also as to the Academy.

In awarding this first medal for the most noteworthy and valuable contribution to the Academy for the past year, it is impressive that the recognition has been of the value of the presented experiences from the wide range of daily work of an earnest worker, combined with the interesting and constructive discussion of the work of others presented here. Experience looms large in medicine, and when experience comes from a broad, deep and original thoughtfulness and is presented with youthful enthusiasm, it is of utmost value to the Academy.

Allow me, Sir, to present with great pleasure the medal awarded by the Academy for the most noteworthy contribution during the past year.

The Committee: A. R. Colvin, Chairman.
Jas. S. Gilfillan
H. A. H. Bouman.

Dr. Arnold Schwyzer (accepting the Academy Medal): I surely feel that this is a very great honor, but I think the Committee might have chosen better when I look around and see the number of men who have made excellent contributions to this Academy. I assure you that I feel very very deeply when I express my appreciation of this testimonial. When an appreciation comes from the men with whom one works and meets all the time, I am sure it is worth more than when it comes from the outside. Though I can't quite see how I have earned it, I thank you heartily.

Dr. H. A. H. Bouman showed an enlarged drawing of the medal and gave the following interpretation:

White civilization while confined to Europe was in great danger a number of times of becoming overwhelmed by the Asiatics. The invasion of the Persians was one of the early historical occasions. The Greeks, under the leadership of Athens, defeated the enemy and dispelled all fear of future invasion. The will to live and to be free men had been hammered out during the years of bitter warfare and a national accomplishment of the first magnitude was theirs. Gratitude and exaltation forced expression; they built the Parthenon on the Acropolis in the sight of all to honor Minerva, their beloved Pallas Athene. The incomparable period of Pericles, which stocked the East and the West with pioneers and leaders, must honor Minerva. Menos, the indomitable mind, striving for the best things in man, his art; the deified personification of this mindedness can be seen in plastic form on the face of this medal. The bust of a marvelous woman; she was not born like others, but sprang from the lofty forehead of Zeus. The head of Gorgo indicates her father's Aegis—the wonderful shield. The visor is tilted back. In peace or war that wondrous human face radiates serene composure and patience, dignity and determination and persistent energy.

All those who brought forth their talents to be used and amplified looked upon her as their patroness; she was the illusiveness of their lives and their realizations. The spirit, that persists to do and accomplish, ruled them whom we call the Salt of the Earth in our day.

Dr. Harold Hullsiek (St. Paul) read his Thesis, entitled "Adenomatous Polyps of the Sigmoid and Rectum"; this was illustrated with numerous lantern slides.

DISCUSSION

Dr. Donald Balfour (Rochester): I enjoyed very much hearing this thesis. Dr. Hullsiek has referred to one very important fact of which we should often be reminded; that is, the necessity for routine rectal examination in all patients. In spite of this being a platitude, one still finds many patients with a lesion of the rectum, sigmoid and colon, associated with bleeding, and who have had, in the immediate past, an operation for hemorrhoids to relieve them.

Dr. Theodor Bratrud (Warren, Minn.): The subject of Dr. Hullsiek's interesting paper interests me particularly with reference to the diagnosis of "intussusception."

I reported in 1914 the case of a 16-year old girl who came to us in 1913. She gave a history of several attacks of vomiting and was vomiting when brought in. We gave her an enema and she had a profuse foul stool. After this, a mass could be felt above the left Poupart's ligament. She started vomiting again and we found an intussusception. We could palpate two small tumors in the sigmoid. These were excised. The stump bled quite freely, so it was whipped over with catgut. The tumors were a little larger in size than a walnut.

She did well until the 14th day postoperative—when she was going to go home, but started vomiting again. This time we found an intussusception on the right side. On opening the abdomen we found that she had an intussusception of the ileum, cecum and ascending colon. We could palpate several more masses in the lower ileum which, on opening the ileum, showed us a group of tumors similar to those in the sigmoid. At that time, we made a general exploration of the abdomen and found a mass higher up to the left of the midline about the size and consistency of a banana. On delivering this mass, we found an intussusception and in this area we found several more tumors similar to those in the sigmoid, which were excised.

After the second operation she was well for about five years, when she was brought to the hospital in a moribund condition. The postmortem showed the lower ileum, cecum and colon intussuscepted almost down to the anus and the bowel was filled with numerous adenomatous polypoid masses.

A year later a 4-year old boy was brought in with a diagnosis of appendicitis. We found an intussusception of the lower ileum, cecum and ascending colon which we could not reduce. A resection with end-to-side anastomosis was done. In the resected piece of bowel we found multiple tumors which were more polypoid in structure than adenomatous. To date, this boy has been well.

We had a case this year of a 70-year old man, very anemic, who had been bleeding for about a year. We found seven polyps in the sigmoid, which were removed by high frequency current. The bleeding stopped and he improved for two or three months but now has

masses in the liver, a great deal of pain in the spine and is going down hill very rapidly.

Dr. L. C. Bacon (St. Paul): It is sometimes interesting to know what nature does with these rectal growths. This excellent paper recalls to my mind a case I saw many years ago. A child 6 years of age had a rectal polypus within reach of the finger. The family refused operation though repeatedly urged to consent. I had an opportunity to follow that case to termination. The pedicle gradually elongated over a period of 6 or 8 months and eventually there was no polypus there. Nutrition must have been cut off through traction upon or twisting of the pedicle and separation occurred.

That case has made me feel that in children, especially in outlying districts, nature certainly does take care of some of them. I am not advocating leaving these cases—not by any means.

Dr. H. T. Nippert (St. Paul): I attended a meeting of the Tri-State several years ago and some man made the statement at one of the sessions, "Don't be afraid to put your finger in the rectum, otherwise you might get your foot in it."

Dr. Hullsiek thanked the members of the Academy for their discussion of his paper.

Dr. F. E. B. Foley (St. Paul) gave a report of "An Unusual Case of Extra-Vesicle Urinary Drainage" and showed several lantern slides. He also discussed the embryology and development of these anomalies of the urinary tract.

DISCUSSION

Dr. Arnold Schwyzer (St. Paul): We owe thanks to Dr. Foley for his splendid presentation of this subject. In listening to him, one cannot help but be impressed by the fact that the more we know the fine points in these anomalies, the more we can find conservative measures. I have heard tonight expressed the respect for the renal parenchyma, and I think that is a very important point. The saving of the parenchyma, if there is a possibility to readjust things, is very important, especially in women with possible pregnancies which may make great demands on the kidney substance.

The variety of anomalies shown here is very interesting and instructive. To emphasize the preservation of what can be saved, let me mention a case I saw yesterday. It is a woman on whom I had done a heminephrectomy, or rather a resection of one-third of the kidney, seventeen and a half years ago. The young woman was brought into the hospital after four weeks' illness. During the last week she had severe chills every day and high temperatures, some pain in the right kidney region, with some albumin and cloudy urine. At operation we found the upper third of the kidney riddled with abscesses. We incised through that upper pole and a little beyond. These abscesses were spread all through the thickness of the parenchyma, but stopped abruptly in a straight line toward the remainder of the kidney. The removal of that upper third of the kidney, with the preservation of the other two-thirds, allowed this woman to face the future with two kidneys. She has since married and has gone through pregnancy without trouble. The result in that case was very gratifying. The patient has had no trouble from that kidney.

In a case of double renal pelvis with hydronephrosis in the upper one, we made an anastomosis between the upper hydronephrotic and the lower normal pelvis. This also gave quite a satisfactory result. The operation was over eight years ago, and the patient is in good shape. This was a pyelo-pyelostomy.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
205 W. 2nd STREET, DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

MULTIPLE INTERCOSTAL NEURECTOMY FOR PULMONARY TUBERCULOSIS: John Alexander (Amer. Rev. Tuberc., 1929, XX, 637). The author resected the phrenic and intercostal nerves on one side of a dog and obtained almost total immobility of that side of the chest as well as a marked falling in of the ribs overlying the lung. Since then he has performed this operation on six patients who were considered too poor a surgical risk for the more drastic procedure of thoracoplasty. Resection of the second to eleventh intercostal nerves together with homolateral phrenic exeresis puts that side almost completely at rest during quiet respiration, due to paralysis of all muscles involved in quiet respiration and in addition some of the accessory muscles used in forced respiration. The remaining unparalyzed accessory muscles function in the necessary cough reflexes and raising of accumulated pulmonary secretion.

Indications for intercostal neurectomy are similar to those for artificial pneumothorax, thoracoplasty and phrenectomy.

The lesion must be predominantly unilateral and artificial pneumothorax or phrenicectomy or both

together should have been given a fair trial and found insufficient due to adhesions. Intercostal neurectomy is the choice in preference to thoracoplasty in patients with poor general cardia-circulatory condition, or too great age to justify even a primary stage thoracoplasty. The chief contraindication is a large amount of sputum (100 c.c. per day) that the patient might be unable to raise because of impairment, by the operation, of the power to expectorate.

The technic of the operation consists mainly in making an incision over the angles of the ribs from the second to the eleventh rib. The intercostal muscles are then incised midway between the ribs, the incision centered at the angles of the ribs, two to three centimeters of each intercostal nerve is resected from the second to the eleventh inclusive, care being taken not to damage the posterior rami that supply the sacro-spinal muscles.

Intercostal neurectomy is not intended as a substitute for thoracoplasty. The former may be used in the cases not suitable for thoracoplasty. Such patients include both those who are too ill for thoracoplasty and those that are not ill enough, and yet for whom further aid is necessary in order to bring about arrest of the disease.

E. F. Allison, M. D.

PLACE OF THE HOSPITAL IN THE PROMOTION OF PUBLIC HEALTH PROGRAMS: Matthias Nicoll, Jr., M.D. (Hospital Social Service, 1929, XX, 456). The hospital must be counted as an integral part of any health program. A tuberculosis sanatorium should be the center of anti-tuberculosis work, especially throughout the rural districts; the superintendent should be on a full time basis and should be a technical adviser on tuberculosis with administrative and teaching capacity to insure the confidence not only of patients but of the local medical profession.

The problem of the care of the insane and mentally defective can only be solved by adequate appropriations for special hospitals.

As recently pointed out by Professor James Ewing, the provision of facilities for diagnosis and treatment of early cancer is a public responsibility which cannot be escaped.

There is a great scarcity of institutions to which post-operative orthopedic cases and others handicapped by disease and accident may be sent for rehabilitation so that they may become self supporting. Such institutions should provide training for orthopedic nurses.

The hospitalization of maternity cases seems logical but a careful study of the equipment and methods of obstetrical service in such hospitals is the duty and responsibility of the organized medical profession at the present time.

The provision of hospital facilities in the rural districts, of community hospitals, properly planned and operated, seems to be a recognized means of securing the retention of capable physicians in such localities, and so securing not only adequate medical attention in both the homes and the hospital. When well established, such hospitals will serve as centers for State and local health services, such as public health nursing, prevention of diphtheria, prenatal care, child welfare clinics, and, in the absence of a local tuberculosis hospital, tuberculosis clinics. It may well be the meeting place also for conference between health officials, state and local, and the general medical profession.

A. T. Laird, M.D.

SURGERY

SUPERVISORS:
DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

OVARIAN TRANSPLANTATION: Chas. C. Norris and Charles A. Behney, Philadelphia (Surg., Gynec. & Obstet., Vol. XLIX, No. 1929, No. 5, 642). What the reaction of the patient to surgical menopause will be is best predetermined by the temperament. The nervous, highly developed, neurotic married individual is prone to suffer most. In selected cases, therefore, where conservation of the ovary has been impossible, ovarian transplants or grafts are desirable.

The series reported consists of patients in the child bearing age and in whom only autotransplantation was done. Practically all were suffering from pelvic inflammatory disease in the chronic stage. The Blair-Bell technic was closely followed in the earlier cases. In later cases the ovary after decapsulation was divided in two, three or four portions and transplanted in separate pockets in the rectus muscle. This method results in better blood supply to each part and higher percentage of "takes." Small grafts not more than eight millimeters in diameter and considerably less in thickness have been most satisfactory.

Advantages in this type of graft are:

1. Complications rarely develop.
2. Should complications occur they are easily handled, being extraperitoneal.
3. Grafts usually "take."
4. The sudden development of the menopause is generally averted, and when it occurs is more analogous to the normal than if the grafting had not been performed.

The life of the transplanted ovary is probably not more than two or three years. The grafts may become tender for a day or two each month but rarely give serious trouble.

C. W. Mayo, Jr.

ACUTE EDEMA OF THE PANCREAS: Edward Archibald (Ann. Surg., 1929, XC, 803-816). By the transduodenal injection of non-infected bile directly into the pancreatic duct the author has repeatedly produced changes in the pancreas of animals which both grossly and microscopically appear to represent acute edema without necrosis. The effect appeared identical when either gall bladder bile or hepatic duct bile was employed. The beginning of this change could be observed grossly within half a minute after the injection. After the elapse of five minutes the major portion of the pancreas had become involved. Care was taken not to inject the bile under pressure. Operation upon the same animals several days later revealed almost complete subsidence of the process both grossly and microscopically. The similar use of infected bile caused the graver lesion of necrosis.

Archibald feels that a condition may exist in the human similar to that which he has been able to produce in animals by the injection of non-infected bile into the pancreatic duct. In substantiation of this persuasion he reminds the reader that not infrequently patients who have had an interval exploration because of a history of repeated short abdominal colics have been found to have a negative abdomen at operation. The inference that the pathologic process had subsided during the interval he thinks quite logical. He further cites a case of his own in which he operated before complete regression of the acute attack had occurred. At operation palpation disclosed definite enlargement of the pancreas, but he was unable to visualize the organ. As further evidence that such a condition may exist he reviews the work of Zoepffel, who in 1922 described acute edema of the pancreas found at operation during the acute stage of the common variety of gall bladder colic.

The symptoms suggesting such a condition consist of severe pain located in the epigastrium with radiation to the left abdomen and left back, associated with localized tenderness over the pancreas and a corresponding area of skin hyperesthesia.

The author feels that all patients having symptoms suggesting such a diagnosis should undergo exploration because of the inability to determine which cases may, if operation be postponed, be found to have acute pancreatic necrosis. The principle of the operative procedure he thinks should be that of bile drainage for one to two months in order to eliminate further similar attacks. He recommends cholecystostomy and removal of stones if present; if cholecystectomy has already been performed, choledochostomy.

JOSEPH B. PRIESTLEY, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:
VIRGIL J. SCHWARTZ,
MEDICAL ARTS BLDG., MINNEAPOLIS
ARTHUR C. DEAN
HOT SPRINGS, SOUTH DAKOTA

STENOSIS OF THE NASOPHARYNX: F. A. Figi, M.D., Rochester, Minnesota, Arch. of Otolaryng., Nov., 1929, 10, 5, 480). Stenosis of the nasopharynx is usually acquired, but there are a few cases of true congenital stenosis in the literature. In the cases of acquired stenosis, syphilis is generally considered to be the most common cause. The next most common causes are trauma, diphtheria, tuberculosis, congenital anomalies and inflammatory lesions.

In the cases seen at the Mayo Clinic the most common cause was trauma incident to the removal of tonsils and adenoids. The interval between the time of operation and the onset of symptoms varied from a few weeks to two years. In about 40 per cent the trouble developed during the first decade of life and in more than 50 per cent the onset was before the age of 20.

The nasopharyngeal stenosis seen in cases of scleroma is always concentric and appears to be due as much to infiltration and thickening of the wall of the nasopharynx as to cicatricial contraction. The symptoms are dependent on the degree of obstruction. The patient often accustoms himself to breathing through a very small opening and may present few or no symptoms. With almost complete atresia the symptoms are those of nasal obstruction. Mucous membrane changes, sinus infection and deafness ensue. Anosmia may be present. Vocal resonance may be changed. Chronic inflammation of the pharynx may also be present.

Many and varied procedures have been advocated and tried for relief of this condition. The simplest and most successful procedure is that presented by Nichols. He inserted a silk suture through the small nasopharyngeal opening well into the lateral extent of the region of scarring. This suture was tied and left in place till a cicatrized tract developed. The posterior border was then freed from its attachment to the pharyngeal wall out to this point.

There has been a great change in the prognosis given patients with this condition in the past few years. The reports of Nichols and Mackenty are very optimistic. A favorable prognosis is given as a routine provided the patient is able to remain under observation for a sufficient length of time, varying from 3 to 8 months.

ARTHUR C. DEAN, M.D., F.A.C.S.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE CONQUEST OF CANCER BY RADIUM AND OTHER METHODS. Daniel Thomas Quigley, M.D. Philadelphia: F. A. Davis & Co., 1929. 539 pages. $6.00.

This is a well printed volume of 539 pages, containing numerous illustrations. Section IV contains extensive data on diseases other than cancer in which radium has proved of value. One almost wonders at times if this book was intended for the layman, since it largely lacks a scientific nomenclature and accuracy as well as methods of technic. For example, we are informed, "Cancer, instead of being a complex thing of which we know nothing, is a very simple thing of which we know a great deal. We probably know more about cancer than about any other chronic disease. The basic fact in connection with new growth of tumors, then, is irritation of living cells by micro-organisms and their toxins. No one micro-organism is known to have such a widespread distribution."

One meets frequently the terms "roots of the cancer," "baby cells," and on page 160 we are informed melanoma growing in the eye may arise from the retina. On page 158 the author speaks of glioma of the eye in the adult.

This writer has tremendous enthusiasm, reporting wonderful results, but he fails to indicate how he obtained these results. We can only wish he had given us a definite technic as to how such results are obtained. Every radium worker welcomes information on this point.

Agreement is accorded his statement that the general practitioner has little conception of the physical properties of this very potent agent he is using and that radium service should be centered in well equipped radium hospitals with a trained personnel.

L. A. Lane, M.D.

A STUDY OF MASTURBATION AND THE PSYCHOSEXUAL LIFE. John F. W. Meagher. Second edition. 130 pages. Cloth, $2.00. New York: Wm. Wood and Co., 1929.

This book presents a thorough study of the subject of masturbation. The importance of the well accepted principle that sex information must begin early in life is stressed, the best guide being the child's own questions. This essay helps to instill the proper insight into the psychosexual life of the child and adolescent that is vital to the proper attitude of the physician. A discussion of the auto-erotic, homosexual and heterosexual trends of the individual lays the proper foundation for the author's chief purpose. He finds masturbation an almost normal phenomenon for the child and adolescent, but not for the adult. The causes, symptoms, sequelæ and treatment of this habit are carefully reviewed. His conclusion that we are dealing with a psychopathological problem, requiring sympathy and understanding rather than medicine or surgery, is in line with the best modern medical thought.

This is a valuable book for anyone interested in the psychology of adolescence. It should be read by parents, clergymen and doctors, especially pediatricians interested in mental hygiene.

D. M. Siperstein, M.D.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIII MARCH, 1930 No. 3

THE REPAIR OF FRACTURES*

CLAY RAY MURRAY, M.D.

Assistant Professor of Surgery, College of Physicians and Surgeons, Columbia University; Associate Attending Surgeon, Presbyterian Hospital in the City of New York

New York City

THIS is a subject of paramount importance to those engaged in the care of fracture cases. Some of the things I have to say will have a very familiar ring—you will find them in every textbook. Other remarks of mine, representing results of my own as yet unpublished investigations, as well as the published investigations of others working in the same or allied fields, will present a queer and interesting mixture of observed facts and attempts to explain them which seems to upset all our earlier conceptions as to the way in which bone tissue heals. Nor are we able, as a result of these newer observations, to replace our old ideas with any definite knowledge of how bone is actually formed in the healing process.

It seems, at first blush, unreasonable to present such a story to practising physicians—a destructive criticism of our present ideas, with no definite alternative to take their place. But the newer observations and the ideas which they have engendered afford us a fresh viewpoint which is of tremendous practical importance in the treatment of fractures. There is a current saying that it all depends on where you sit as to just what the picture looks like. And, as we have had to change our seats, so the picture has changed. We can begin now to understand why so many practical measures, which we have heretofore employed purely empirically, are successful, and therefore we are able to apply these measures more intelligently. We are able also to guard against, and to treat more intelligently and successfully, those conditions which we are accustomed to call delayed union and non-union. After all, it is the practical application in treatment of the ideas gained by modern research along these lines, and not the didactic discussion of them, that is important to men who are interested in the actual care of fractured bones.

All that follows deals with conditions in the adult only. The cell characteristics of the child may well be an entirely different story—there is much evidence that this is so—just as the clinical picture in children is so different from that in adults.

Let us first take up what we actually know about fracture healing. The picture of the gross in terms of visible callus or bone has not been materially improved upon since the description by Dupuytren in his Lecons Orales.[1] The whole story occupies six to twelve months, as illustrated in Figures 1 to 4.

Figure 1 represents the early provisional callus, which appears in two to four weeks. As one can see, it is similar in appearance to the plumber's wiping of a joint. It is usually fairly firm, but will slowly yield under pressure or continued stress of any considerable degree. The *x*-ray visibility is dependent on the amount of calcium present in terms of density of distribution. This may vary considerably, as may also the total amount of this callus, being least in greenstick and subperiosteal fractures and most in those with periosteum torn and with comminution of bone.

Figure 2 represents the gross picture of healing at eight to twelve weeks. The outside callus has been reinforced by a plug of callus joining the medullary canals of both fragments. There is as yet no bony union between the cortices of the two fragments. In the upper extremity this usually provides union sufficiently firm for full function without danger. In the lower extremity, because of the added function of weight bearing, it may not be sufficiently strong for full function, depending upon the weight of the indi-

*From the Department of Surgery, College of Physicians and Surgeons, Columbia University, New York. Read before the Great Northern Railway Surgeons Association, at Seattle, Washington, July 5, 1929.

vidual, the calcium density of the callus, the location of the fracture from the viewpoint of weight-bearing mechanics, etc.

Figure 3 shows the condition present at the end of four to six months. The outside callus has diminished

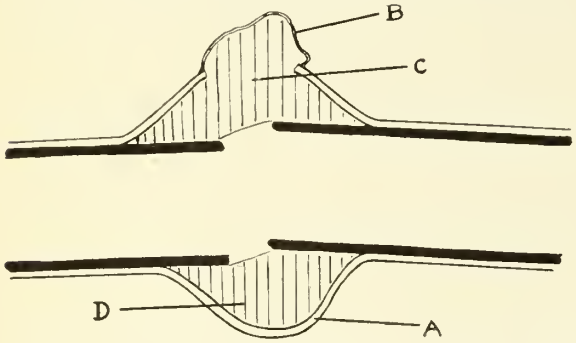


Fig. 1. *A.* Stripped-up periosteum. *B.* Torn periosteum. *C.* Callus. *D.* Callus.

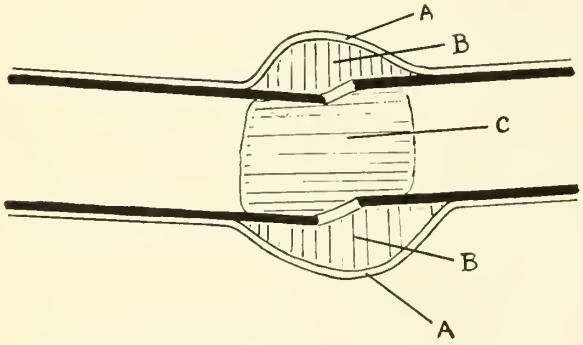


Fig. 2. *A.* Periosteum. *B.* Outside callus. *C.* Medullary callus.

in size and increased in density; the medullary canal shows a bony plug with visible vascular channels, and the cortices of the two fragments are joined by a bony callus. This is so-called solid bony union. Subsequent changes deal only with the architecture of the bone. That architecture is supposed to be in accordance with the stress and strain to which the bone is subjected—the so-called Wolff's law. As Carey[2] has shown, the factors involved may be many and varied. If subjected to the stress and strain normal for the bone involved, the normal architecture will be regained. If not, an architecture will be attained which is in accordance with the modified stress and strain placed upon the bone. This is not of necessity a mysterious or complicated process. A steel girder or column subjected to a given stress and strain will arrange its lines of crystallization in accordance therewith, and if the stress and strain be changed for a sufficiently long time it will rearray those lines to meet the new conditions. It is to bring about this resumption of normal architecture that fractured necks of the femur, after healing has taken place, are put on partial weight bearing, protected against compression of the callus and resultant angulation and coxa vara deformity by a walking caliper for some months. We know from experience that the homogeneous callus at this crucial point as regards weight-bearing is frequently unable to bear the burden until the lines of force transmission in the neck of the femur are at least partially restored by the action of Wolff's law.

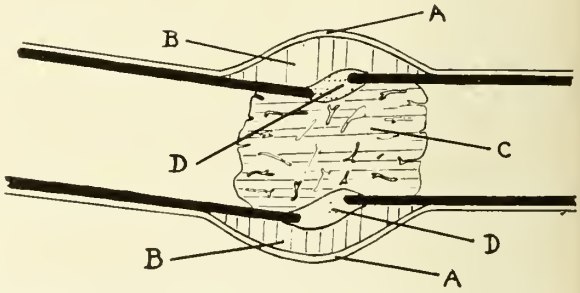


Fig. 3. *A.* Periosteum. *B.* Outside callus. *C.* Medullary callus. *D.* Cortical callus.

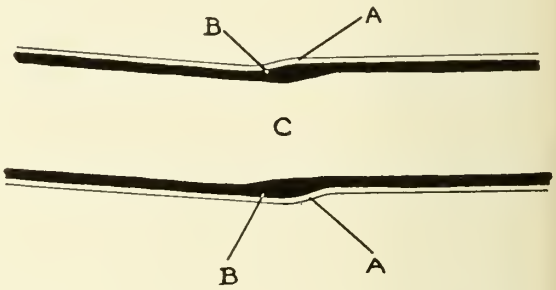


Fig. 4. *A.* Periosteum. *B.* Cortex. *C.* Medulla.

Figure 4 represents the final result nine to twelve months after fracture. The bone is healed and has regained its normal architecture, completing the picture in the gross.

Let us now turn our attention to the study by the microscope of what actually occurs in bone healing. On this score the newer observations have revealed facts which can be demonstrated in the illustrations which follow. These facts have changed completely our conception of how bony injury heals, and have done much to undermine our ideas as to how bone replaces the mere healing to give solid bony union.

The illustrations comprising Figures 5 to 22 are taken partly from articles published by Bancroft* [3,4,5,6], partly from his own private collection and partly from the files of the Department of Surgery, Columbia University. The observations recorded and the conclusions drawn are partly Bancroft's own as published, and partly mine as made in a further study of his work in conjunction with my own experimental study of fracture repair as cited below.[7] (The originals of the illustra-

*I am indebted to Dr. Bancroft for his courtesy in allowing the use here of his illustration. It is a pleasure to acknowledge my indebtedness to him not only for the illustrations and his own observations, but for the stimulus derived from his work to further study of the question.

tions were previously published in the following periodicals: No. 18, Am. Jour. Med. Sci.; Nos. 7, 9, 19, Arch. Surg.; No. 8, Ann. Surg. and New York State Jour.)

Figure 5 is diagrammatic of the details of the gross

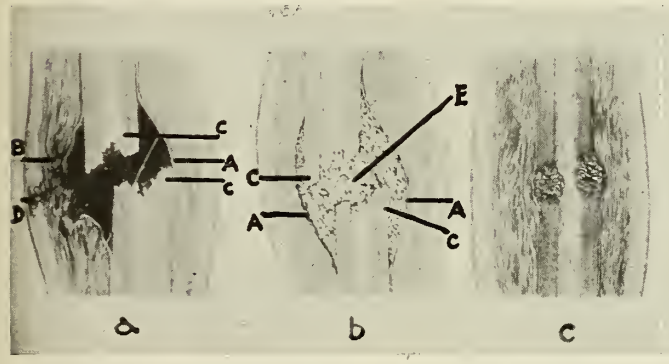


Fig. 5. *A.* Periosteum, real or apparent. *B.* Torn and infiltrated muscle. *C.* Broken bone ends. *D.* Infiltrated subcutaneous tissue. *E.* Callus.



Fig. 6. *A.* Periosteum. *B.* Subperiosteal bone. *C.* Cortex. *D.* Medulla. *E.* New bone, with Haversian system at right angles to shaft.

shown in Figures 1 to 4. "a" represents the pathology at the time of fracture. It shows the broken ends of the bone (C), which we shall show later undergo death and autolysis to a variable degree. The periosteum is represented as intact on one side (A) and torn on the other. It is obvious that all granulation tissue on the sound side will of necessity be derived from the only soft parts available, which are the under surface of the periosteum, the so-called endosteum of the broken edges of the bone and the marrow tissue of the fragments. On the torn side it is equally obvious that the torn and lacerated muscle and fascial planes are allowed access to the fracture site, and granulation tissue produced in them can grow in to the site of the fracture. The extent and location of the hemorrhage and exudation at the fracture site is also worthy of note because of its distribution and the fact that the swelling produced causes a variable amount of circulatory and lymphatic disturbance (B) (D). These factors will all be dealt with later as to their influence on the course of the healing process. "b" represents the callus healing stage. The periosteum will be noted as apparently restored where it was torn before. As we shall show later, with tearing as extensive as here shown, the restoration of periosteal integrity is apparent and not real, the bridging tissue being derived from connective tissues outside the periosteum, viz:, muscle and fascial planes. The only morphological difference observable is the absence of the very vascular inner layer present in normal periosteum. Despite its source and this morphological difference, the new tissue functions effectively, and, so far as we can tell, in a normal manner as periosteum. This detail will be referred to again in its bearing on the question of the specificity of the periosteum as a tissue. The bony callus represented in this diagram shows numerous vascular channels, which we will show later to be at right angles to the long axis of the bone and to be the vessels of granulation tissue derived from outside the bone, in part at least. The question of the origin of the calcium deposited in that tissue to form bone will also be a matter for clarification. "c" represents the healed state with restoration of the bone architecture.

Figure 6 is diagrammatic of a late stage of callus repair and is a little more detailed representation of "b" in the preceding figure. Its captions explain it and it holds the same points of interest as were detailed in Figure 5 "b."

Figure 7 is a microphotograph of the healing of a comminuted fracture. In it can be noted the numerous fragments with microscopical evidence of death, as shown by lack of nuclear staining, and death of the ends of the cortical bone on either side of the region of comminution, with new bone production taking place about these areas of bone death. The direction of the vessels in many of these areas agrees very accurately with the diagrammatic representation in Figure 6, and the point brings up similar questions as to the source of the tissue of origin and of the calcium involved. The formation of the pseudoperiosteum and the absence of the deep vascular layer in it is also shown. The fact that the new bone formation occurs primarily about areas of microscopically dead bone is also a fact to be kept in mind.

Figure 8 represents a late stage of experimental comminuted fracture. The experimental technic was that of Bancroft in the study of repair of bone defects by the use of chip grafts. About one inch of a dog's radius was excised with its periosteum. The ulna was left intact to maintain the gap. The excised portion was scraped free of periosteum and fragmented and the small fragments were freed from so-called endosteum in so far as possible by scraping and then dropped back into the gap and the muscles sutured lightly to hold them in place. While devised for the study of chip transplants, the procedure reproduced realistically the condition of comminuted fracture with the fragments separated from the periosteum and with wide tearing of the latter. Studying the microphotograph from the viewpoint of a comminuted fracture of this type of 141 days duration, we see at A the broken

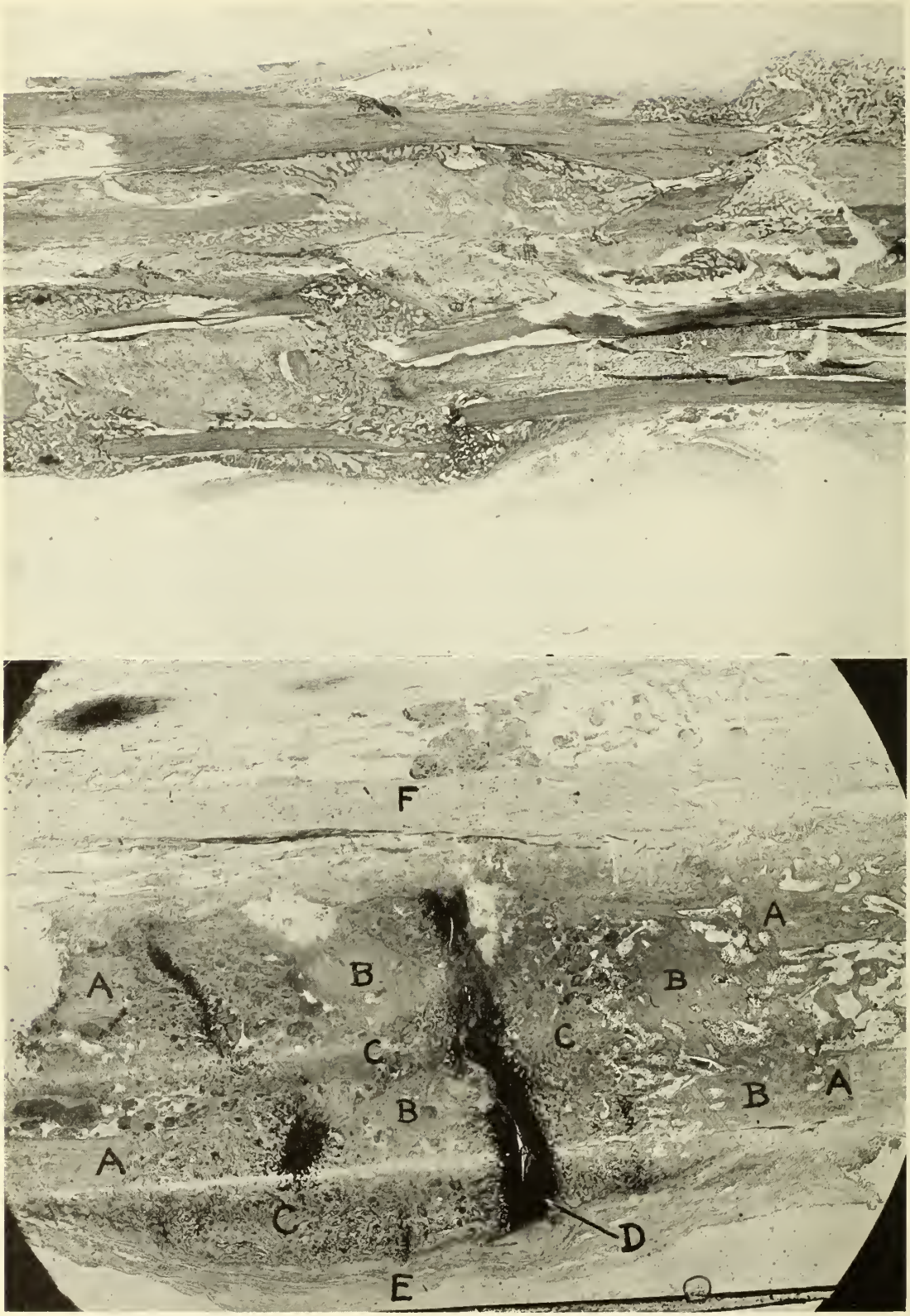


Fig. 7 (*above*). Healing comminuted fracture.

Fig. 8 (*below*). *A.* Broken bone ends (radius). *B.* Fragments. *C.* New Bone. *D.* Cartilage. *E.* Pseudoperiosteum. *F.* Ulna (intact)

bone ends with the comminuted fragments B lying between them, both showing microscopic evidence of death. The whole is amalgamated by a variegated structure comprising new bone, cartilage and connective tissue extending laterally on both sides beyond the bone limits for a considerable distance. We see that the new bone formation is to be observed principally about the bone fragments and the broken ends of the bone. We note that for a short distance from each broken bone end the direction of the vessels is in the long axis of the bone, but that in the intervening area, comprising four-fifths of the original gap in the bone, the vessels are at right angles to the long axis of the bone. In earlier sections these vessels are shown to be continuous with and apparently a part of the granulation tissue proceeding from the soft parts. These facts are of significance in regard to the question of the tissue of origin of the healing process, the source of the calcium utilized to transform that tissue into bone and the rationale of that transformation. We see also the formation of a pseudoperiosteum by the surrounding soft parts as in previous figures. We note also the diverse types of tissue present—cartilage, connective tissue and new bone—a matter into which we must inquire more deeply as we go on.

Figure 9 represents a low power microscopic picture (x 150) of one of the included fragments shown in Figure 8. The areas of obviously dead bone are denoted by the absence of nuclear staining, although the cell spaces are plainly apparent. One notes also that the vessels are apparently viable, as shown by normal nuclear staining of the vessel wall. Are these vessels the original ones of the bone fragment "revivified" by a new nutritional supply, or are they new vessels? Study of similar sections from a few days onward to the stage here shown makes it apparent that these vessels are new; that they are the vascular buds of granulation tissue invading the chips of hard bone by the only available channels—the pathways of the old vessels—just as they invade the fibrin network at the site of fracture. These vascular buds consist of the capillaries surrounded by a thin layer of accompanying fibroblastic cells. In the new channels which they occupy, one notes that live "bone cells" seem to exist in three or four layers in the cell spaces in the immediate region of the vessel and nowhere else. Are these "revivified" bone cells brought to life by the reëstablishment of circulation? If the site of this picture were out in the healing soft parts we should state immediately that they were the fibroblastic cells surrounding the capillaries to make so-called granulation tissue. And that is all they are here, invading in their progressive growth the only available space—the empty cell spaces in immediate proximity to the vessels which they accompany. And they are bone cells only as regards the fact that they occupy the cell spaces in the bone. Morphologically and by staining reaction they are not to be distinguished from fibroblasts.

Figure 10 is a higher power (x 375) of a small section of the picture shown in Figure 9, and brings out all the details more clearly. The morphological appearance of the cells, their distribution and the presence of empty cell spaces in the avascular areas are readily noted in this microphotograph.

Figure 11 represents a section taken through the site of a linear fracture in a dog which was given immediate treatment. The section was made after two weeks, at which time gross healing was apparently accomplished. At (B) will be noted the end of one bone fragment with absence of nuclear staining and empty cell spaces. This is "dead bone," comparable to the state of the bone chips in previous illustrations. At (E) there is to be seen "cyst" formation in the bone fragment end—an evidence of bone atrophy or the demineralization process. This is important. Some bone is killed by the trauma and by the vascular disturbance attendant upon it, and that dead bone is demineralized. This is comparable to the autolysis of any dead tissue through the action of ferments freed or activated by tissue death. What is important is the question as to what happens to the calcium freed by the demineralization of the bone and as to the form in which it exists. Circulation in this injured area is sluggish and slow, due to mechanical as well as inflammatory factors. This must be kept in mind. We do not know the form in which calcium exists in the bone or in the blood or tissue fluids. At (D) will be observed normal bone. (C) designates the callus lying between the bone ends. The apparent direction of growth is not from bone end to bone end, but is across the gap, perpendicular to the long axis of the bone fragments. This, as we have noted, is the direction of growth of the granulation tissue which later becomes bone in the experimental comminuted fractures cited above. (A) represents an area of cartilage present in the callus, although no preexisting cartilage can be premised, except on the basis of cell rests of embryonal origin. In this cartilage area the cell types range from frank cartilage cells to cells indistinguishable from the fibroblastic type, and the ground substance varies from the typical blue staining hyaline substance to that which is indistinguishable from the adjacent collagen fibers of ordinary connective tissue.

Figure 12 is a microphotograph of a three-day human callus recovered at operation. It is of extreme interest in that it shows typical new bone formation at this early stage in new connective tissue. In the upper right hand and lower left hand corners we can see fairly dense areolar tissue. The center of the picture is occupied by a loose meshed tissue in which calcium has been deposited to form a lace-like structure of new bone. The cells lying in this mesh of calcium are identical morphologically with the fibroblasts lying in the tissue outside. The calcium matrix merges into the basement substance of the areolar tissue at points so imperceptibly that it is extremely difficult to tell just where calcium deposition begins. In the lower right hand portion the typical appearance of new forming bone is present with linked, roughly ring-like areas of calcium surrounding small areas of areolar tissue; in the latter the capillaries are present. This will be shown in detail in later illustrations.

Figure 13 is a drawing made from a microphotograph of a nine-day human callus which shows more clearly

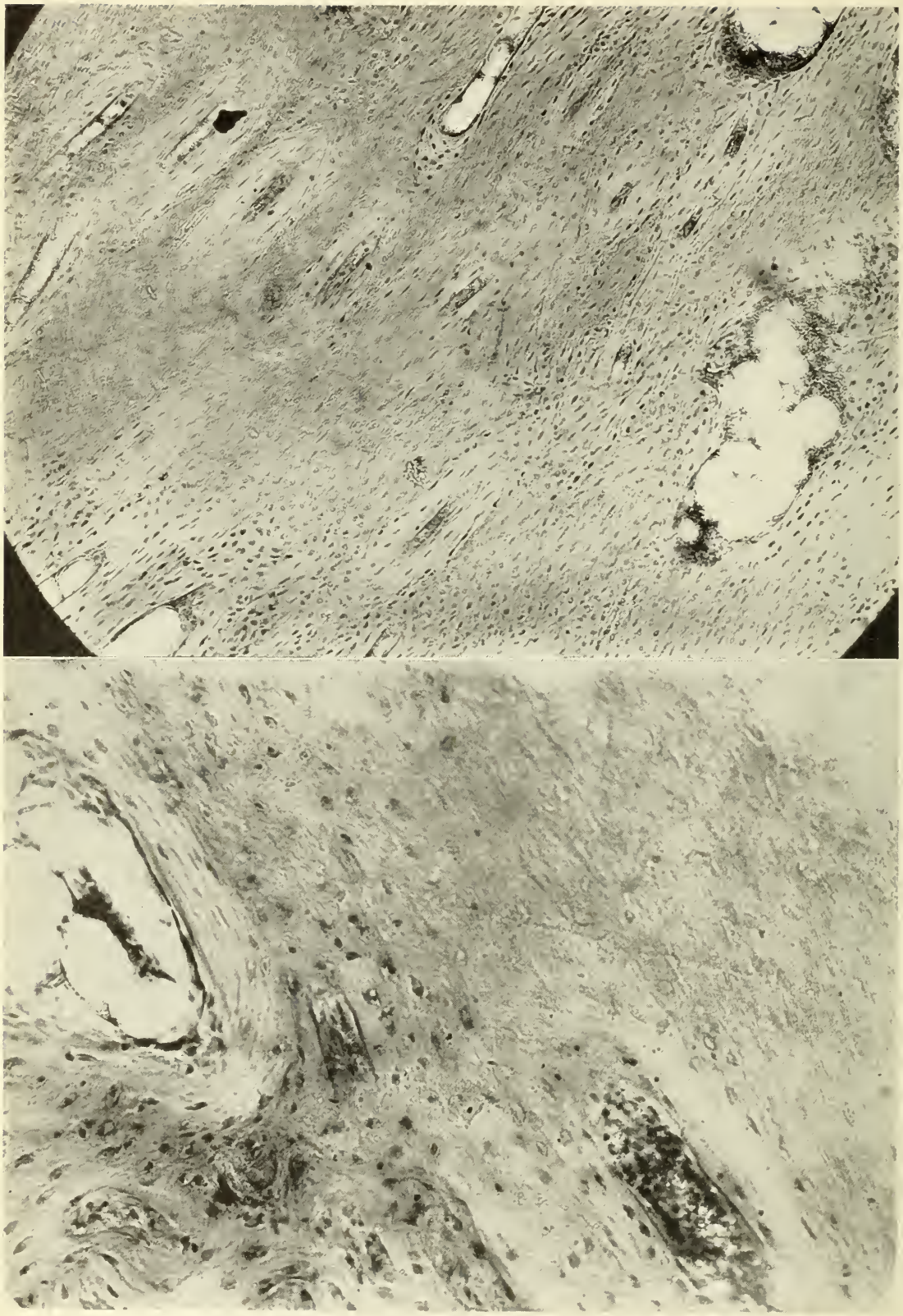


Fig. 9 (*above*). One of included fragments of Figure 8 (× 150).
Fig. 10 (*below*). High power of section of Figure 9 (× 375).

the features noted in the last figure. The background again is the loosely meshed tissue of growing fibroblasts with its accompanying capillaries—granulation tissue. In it is the lace-like mesh of calcium deposition. Any single mesh is found to consist of a central capillary surrounded by an area of fibroblasts and the deposition of a rough ring of calcium outside this area —that is, in the relatively avascular zone. The cells lying within the calcium deposition again are identical with those comprising the areolar tissue outside, and the areas of calcium deposition merge very gradually into the matrix of the areolar tissue wherever they do not link up with other areas of calcium deposit. (A) represents a capillary, (C) the areolar tissue which surrounds the capillaries, and (B) the deposition of calcium about the cells in the outer zones of (C)—the relatively avascular areas.

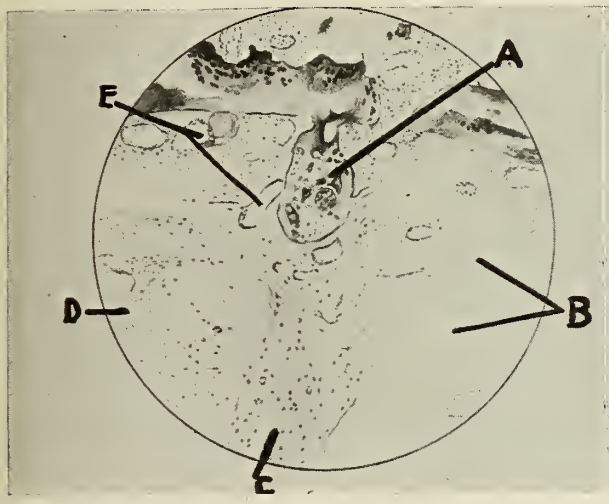


Fig. 11. *A.* Cartilage. *B.* Adjacent cortex. *C.* Callus. *D.* Normal cortex. *E.* "Cyst" formation.

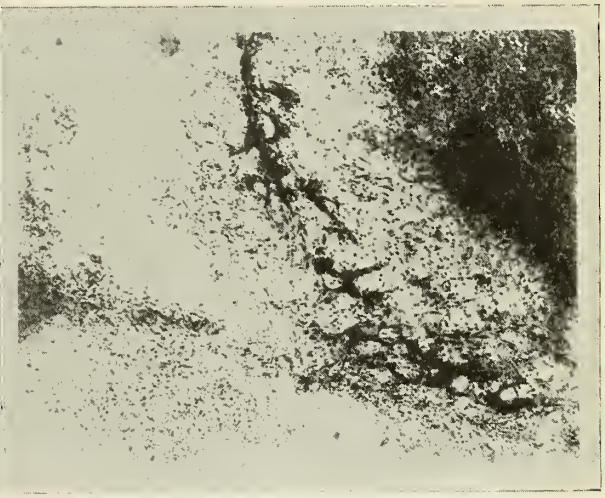


Fig. 12. Three-day human callus.

Figure 14 is a high power microphotograph of the preceding one, designed to bring out the details. One can see clearly the identity in morphology of the fibroblasts and the bone cells, the background of loose meshed fibroblastic areolar tissue and the mode of formation with the central capillaries, the surrounding areolar tissue and the calcium deposition in its outer relatively avascular zones. Also clearly demonstrated is the gradual merging of the calcium-impregnated areas with the collagen background of the areolar tissue, so that in spots it is difficult to tell just where calcium begins and ends. One is struck by the fact, after the study of many of these sections, that if this were a water color and it were possible to wash out the deep pink of calcium the resultant picture would be the classical one of granulation tissue, although no morphological change would have been effected. Between this early bone and granulation tissue there is no appreciable difference save that some process has deposited calcium in a constant pattern throughout the granulation tissue. How is this done? Is this a cell activity or a purely physico-chemical process? Where does the calcium come from and why does it deposit as it does?

Figure 15 is a drawing representing the appearance of a microphotograph of callus appearing in muscle adjacent to but not connected with a fracture of a human humerus of twelve days' duration. It was recovered at operation. There are several points of significance in it. In the first place, this new bone formation has occurred in muscle tissue unconnected with bone. Bone has appeared without a bone nidus for growth, unless we are to premise the wandering of osteoblasts from the fracture site to the site of bone formation in the muscle. Without that premise we must assume a local metamorphosis of some other cell into a specific bone-forming cell, or a process which occurs without the action of any functionally specific cell. In the second place, we must consider where the calcium comes from which is utilized to form this new bone and how it is utilized. Morphologically one notes in this section all the features seen in previous sections, including the diversity of tissue present, the morphological identity of the cells, the typical arrangement of the new-formed bone with its central vascular channels (B) surrounded by areolar tissue and, in the avascular zone, the newly deposited calcium (C). The degenerating muscle fibers are seen at (A).

Figure 16 gives another example of early callus. It shows again the typical arrangement of the new-forming bone and, in addition, emphasizes the apparent diversity of tissues present and the extremely gradual merging of the one into the other. It emphasizes the point that these tissues at this stage are not to be differentiated by cellular morphology, but by the differences in background. Here we find, with practically identical cell types morphologically, tissues which we can call bone, hyaline cartilage, fibrocartilage and fibrillar connective tissue, purely because of the ground substance in which the cells lie. These ground sub-

stances are or are not the product of the cells. They vary, although the cells show no visible evidence of functional variation. Moreover, these backgrounds merge very gradually one into the other. Is this evidence of varying degrees of functional metamorphosis finally become so-called scar tissue with long flattened cells lying between the collagen fibrils comprising the ground substance.

Figure 19 represents a microphotograph of the callus adjoining one of the bone ends at a fracture site. This

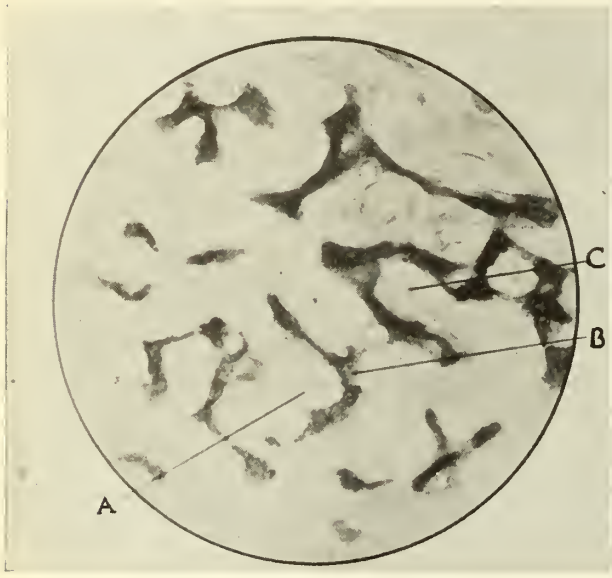


Fig. 13. Nine-day human callus.

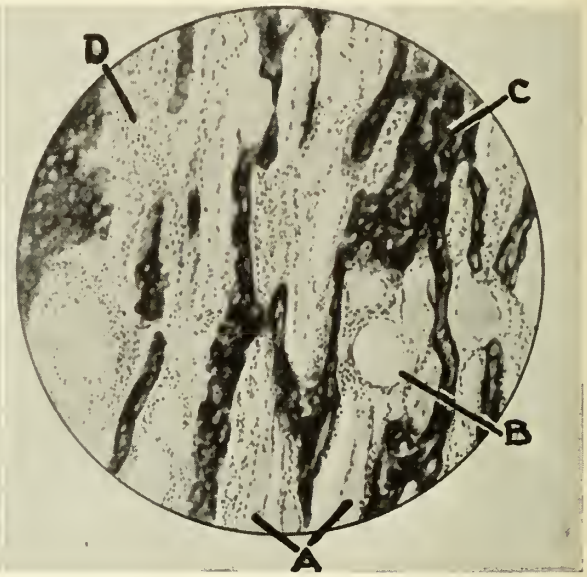


Fig. 15. Human callus, 12 days' duration. *A*. Degenerating muscle fibers. *B*. Blood vessel. *C*. Calcium. *D*. Areolar tissue.

of cells without morphological change? Or is it evidence of the lack of specific connection between the functioning cell and the ground substance in which it is embedded?

Figure 17, a microphotograph of another specimen of early callus, again focuses attention on all the points cited in the discussion of the preceding figure. These specimens of early callus are well worth careful and detailed study as to all the points cited in connection with them.

Figure 18 shows a specimen of callus of later date than shown in the preceding illustrations. The formation of the Haversian canal systems in spongy new bone is now apparent. The avascular zones are the sites of the intercommunicating bands of calcium deposition. These bands are becoming more sharply defined. The gradual merging of the ground substance of bone and connective tissue, although still present in numerous areas, is becoming a less marked feature. The calcium bands seem in general to have become more sharply defined and to have definite sharp margins. Cell morphology is still generally undifferentiated, although it is becoming apparent that those cells which lie in the denser and more rigid medium, which is becoming constantly more dense and compact because of continued calcium deposition, are beginning to look flattened out and elongated. Casting about for comparison, one calls to mind that in loosely meshed new growing connective tissue in a healing process one observes an identical change as that tissue becomes denser and denser, to is a late stage in the process. Again we see the characteristic pattern of the new bone formation, heretofore commented upon; again the diversity of tissue types. In the lower left quarter of the picture the merging of one background into the other is apparent. Elsewhere the definition is sharper. Morphological differentiation of the cells of new bone and connective tissue is difficult. Where that new bone is densest, there the cells are perhaps a little more flattened and elongated. When we look at the old very dense cortical bone, we note that the cells are elongated and flat and are therefore morphologically different from those of the newformed bone. Does this morphological change mean functional difference or is it purely the physical effect of the embedding medium? Note also in this figure the evidences of some death in the old bone cortex as evidenced by the absence of nuclear staining and the empty cell spaces. Note also that the new bone is formed about this cortical bone as a nidus and not down in the left lower quarter, where no preëxisting bone is present. Is the cortex a nidus about which the new bone forms because of the presence there of live bone cells which take part in or initiate the process, or because of the presence of the dead bone? How can the dead bone act as a nidus for new bone formation?

In *Figure 20* we have a microphotograph of tissue taken from between the bone ends of a fractured human femur at the end of twenty-eight days. There was considerable motion at the site of fracture. The diversity of tissue present is again apparent, as also is the

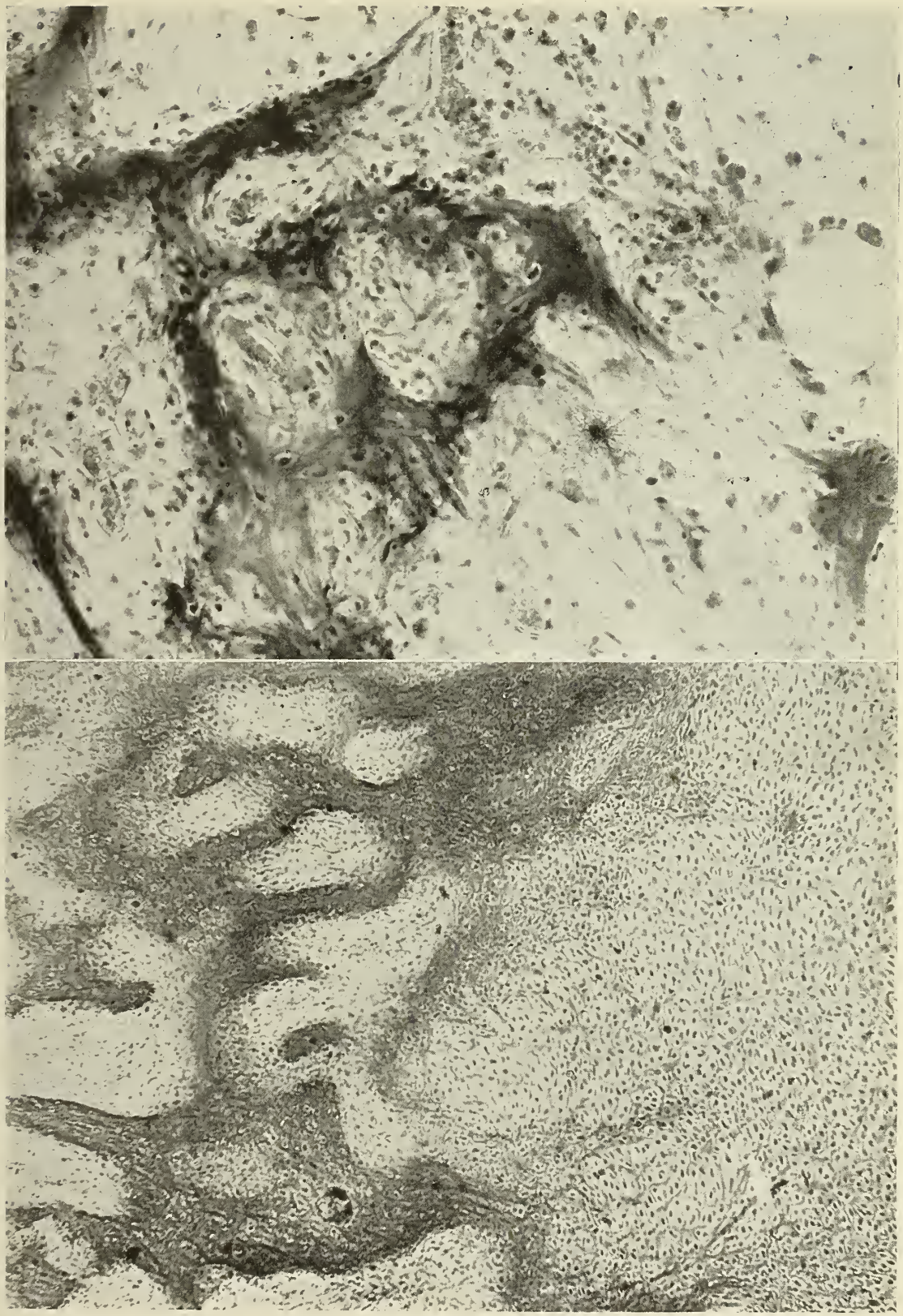


Fig. 14 (*above*). Higher power of Figure 13.

Fig. 16 (*below*). Early callus.

pattern common to new bone to which attention has been called in previous figures. In a low power picture, such as this, cellular morphology cannot be the object of accurate observation. One notes readily, however, a larger amount than usual of cartilage. Whence is this tissue derived and how? If morphology is to count for much, surely we should suspect this tissue of specificity if we are going to talk of specific osteoblasts *per se* or by adaptation or metamorphosis. Frequently repeated one meets the assertion that undue movement at the site of a fracture favors the presence of cartilage in the callus. What is it that such mobility at a fracture site can influence to have such effect, if this story be true?

Having viewed the observed facts as to what actually happens and propounded some of the questions which these observations have brought into our minds, let us go now into the question as to how this process which we have studied is accomplished.

We have been accustomed for years to talk of osteoblasts. These we have conceived to be specialized forms of connective tissue cells—cells having the specific function of forming bone by the laying down of calcium salts (?) about them in the intercellular substance in which they happen to be. Assuming for the moment that this idea is a correct one and that we are on safe ground, let us follow out the story. At the time of fracture we have seen that there is hemorrhage from the bone ends and in the traumatized soft parts, with some tissue death in both those structures. As a result of the effused blood (which is a marked chemical irritant when free in the tissues), of the physical insult, and of the mechanical blocking and destruction of both blood and lymph channels, there is added a profusion of exudate rich in fibrin. The necessary ferments being at hand, set free or activated by tissue death, the hemorrhage and exudate clot. That is, they lay down an entangling fibrin network between and about the bone ends and in the adjacent soft parts to which they have access. The remaining fluid portion of the blood and exudate follows tissue planes to the surface to appear eventually as the extensive ecchymosis seen in fracture cases. The fibrin clot is promptly organized as granulation tissue by the ingrowth of capillary buds and their surrounding fibroblasts. This tissue is derived solely from the connective tissue in the structures involved—periosteum, endosteum, vessels, fasciæ, the stroma of muscle tissue and the areolar tissue between them. Experimentally, as we have seen, it is possible to prove that under given conditions most of this may come from soft parts without the bone. In a subperiosteal fracture it must obviously be derived totally from the soft parts of the bone—periosteum, so-called endosteum, and the areolar tissue of the marrow spaces. This granulation tissue, from wherever derived, surrounds the bone ends and joins them one with another and with the adjacent and available soft parts. *It constitutes the healing of the wound in bone,* just as similar tissue constitutes the healing process in muscle, cornea, liver or other tissue. Up to this point we have been talking of observed facts. Assuming the osteoblast as an identity, we may now theorize as to what happens to cause calcium deposition in the manner in which we have seen it deposited to form a calcium matrix granulation tissue called bone instead of a collagen matrix connective tissue. In this granulation tissue must be enmeshed such osteoblasts as were freed without death by the mechanical violence of the fracture rupturing the cell spaces. A certain number of osteoblasts are killed by the violence plus the inflammatory reaction, and the bone matrix occupied by them is autolyzed by ferments freed by tissue death and is partly absorbed but mostly remains as a high calcium concentration locally in the tissue fluids. The fate of this matrix is also an observation of fact and not theory. The exact state in which this calcium exists is unknown. The exact state in which the calcium of the blood exists is not known. Both these points will be referred to again. To return to our osteoblastic muttons, other osteoblasts grow out from the ends of the bone, invading the granulation tissue and laying down their calcium matrix about them as they do so in increasing density. The very early callus of thick gelatinous fibrin-rich exudate invaded by granulation tissue with relatively little calcium becomes harder and firmer, but completely retains its form of granulation tissue. Morphologically there is no way of telling these osteoblasts from the cells of connective tissue, or the granulation tissue from the early callus, as we have seen, except by the presence of a calcium deposition which merges imperceptibly into the collagen of the connective tissue fibrils. In many of the experimental specimens actual fibrillar striations are seen directly continuous with those of adjacent connective tissue. The calcium involved must be part of the cells' metabolic activity, and

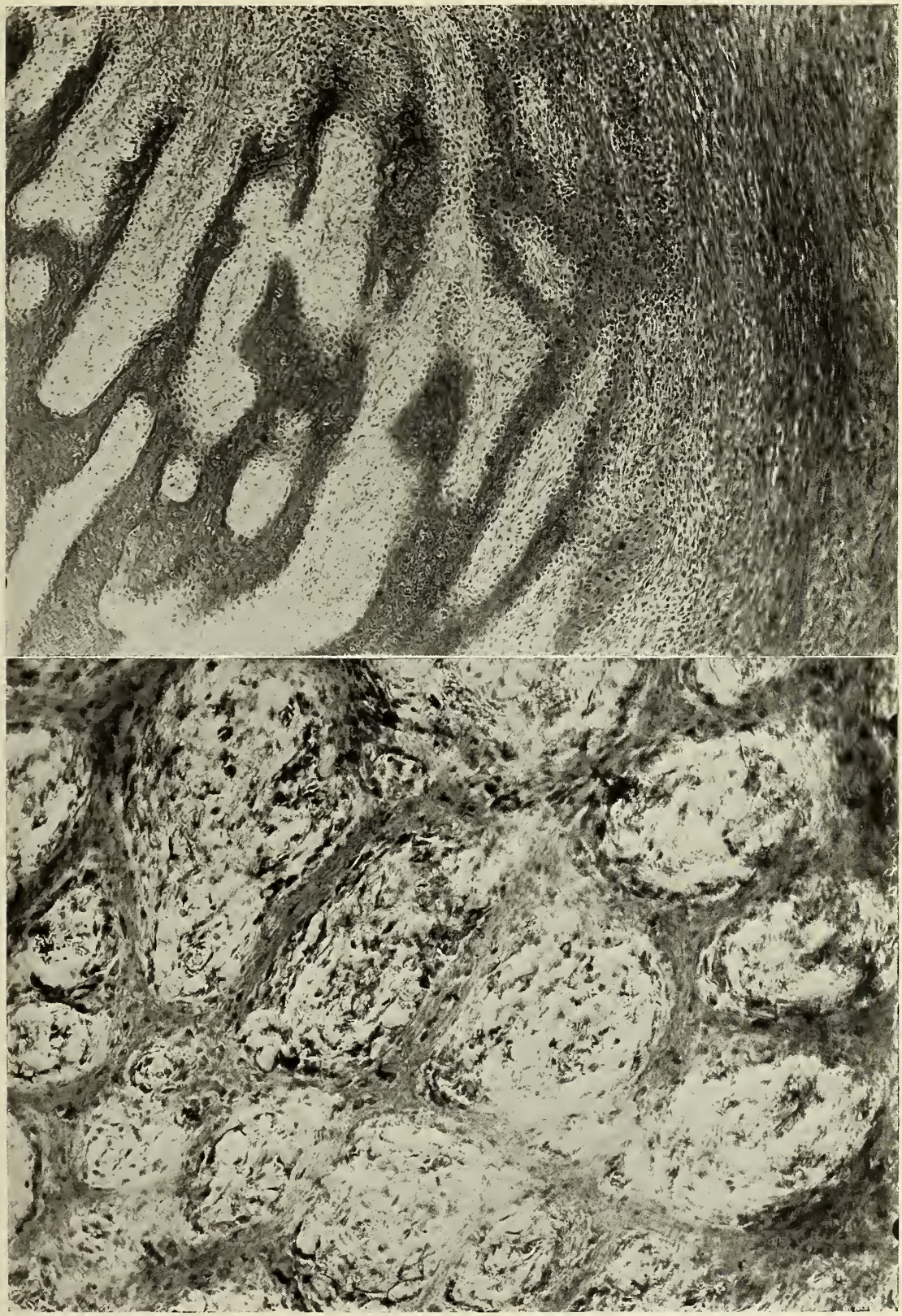


Fig. 17 (*above*). Early callus. Compare Figure 16.

Fig. 18 (*below*). Late callus. Compare Figures 16 and 17.

its source should logically be, and has been presumed to be, the blood stream. The argument as to the exact source of these specific osteoblastic cells, whether from periosteum's cambium layer, bone, or endosteum—which has been in progress since the days of Barth,[8, 9] Ollier,[10] Duhamel[11] and John Hunter,[12] through MacEwen[13] to modern times—can be epitomized in the statement that under the osteoblastic theory from today's viewpoint the cells are derived from all three of the sources mentioned.

Bony callus having been formed thus, the molding or architectural story from then on is a physical one and has no bearing on the formation of bone.

Here we have what sounds like a pretty straightforward story. Yet there are numerous flaws in it. Sometimes the activity of these specific cells is apparently interfered with. The purely mechanical bar of interposed tissue or widely separated fragments we can, of course, dismiss as readily understandable, no matter what idea we may have as to the mechanism of bone repair. But frequently under ideal conditions—that is, with early and accurate reduction and treatment thoroughly approved by textbook standards—we are confronted, perhaps, by an exceptionally slow callus and bone formation which we call delayed union. Or we get an absolute failure of callus or bone formation which we call a non-union. Or, still again, we get good callus, satisfactory *x*-ray evidence of bony union with solidity of the parts, only to find absorptive changes coming on with marked decalcification at the fracture site and eventually a fibrous union remaining. This is not an unusual story in fractured neck of the femur, the proximal neck fragment absorbing after as long as six to nine months right down to the intertrochanteric line. Under any of these circumstances we are given to stimulating these specific bone-forming cells in various ways. Empirically it has been discovered that they can at times be awakened from their unexplainable apathy by various forms of insult. When so aroused they seem to proceed to lay down calcium, as a well-behaved osteoblast should do, and bony union occurs. At other times such insult seems to be of no avail, no bony union occurs and we are left with a so-called non-union. Some of the physical means of stimulation used are frequently repeated tappings over the fracture site with a light mallet, repeated grinding together of apposed surfaces with moderate force and only slight motion range, repeated needling of the fracture site, exposure to *x*-ray and weight-bearing with support. The chemical means include the injection at the fracture site of numerous irritants from blood through a long range of chemicals. One might feel, perhaps, that these cells failed because the source for their calcium metabolism, *viz.*, the blood stream, was deficient in amount or in kind. Feeding these patients calcium or phosphorus or both has no appreciable effect, nor in my own experience has the feeding of vigantol or irradiated ergosterol, with the idea of increasing the blood phosphorus, or of parathyroid, with the same idea in mind. Some years ago Tisdale[14] reported the consistent finding of a raised blood phosphorus in adults during fracture healing extending over a period of weeks, and construed the phosphorus rise as an indicator of increased calcium activity. The absence of such a rise was presumptive evidence of a threatened non-union. He found such a conjunction in a few cases. Subsequent workers have consistently failed to check on his findings. Working with Eddy,[15] the bio-chemist at Teachers College in New York, on a series of cases in New York Hospital and other hospitals, I could find only partial corroboration of Tisdale's conclusions, but found that the same phosphorus rise occurred in any extensive soft part healing—such as large granulating operative wounds, extensive granulating burns and extensive fibrosis due to phthisis. Also, the extent and amount of callus formation bore no definite relation to the phosphorus rise. Eddy's impressions were not in exact accord with this opinion. His chief interest lay in the methods used to determine the blood phosphorus figures—mine in the clinical study of the cases. To date there is no corroboration over a year's period in the Fracture Service at the Presbyterian Hospital in New York, where a blood phosphorus and blood calcium is taken weekly on every fracture case. Cases showing actual decalcification at the site of fracture have shown normal calcium and phosphorus blood findings. This is true also of fractured neck of the femur cases. It seems difficult, then, to blame non-union on lack of blood calcium to provide to the osteoblasts. By some of those who hold to the osteoblastic theory the problem is now being worked on, under many technical difficulties, on the basis of

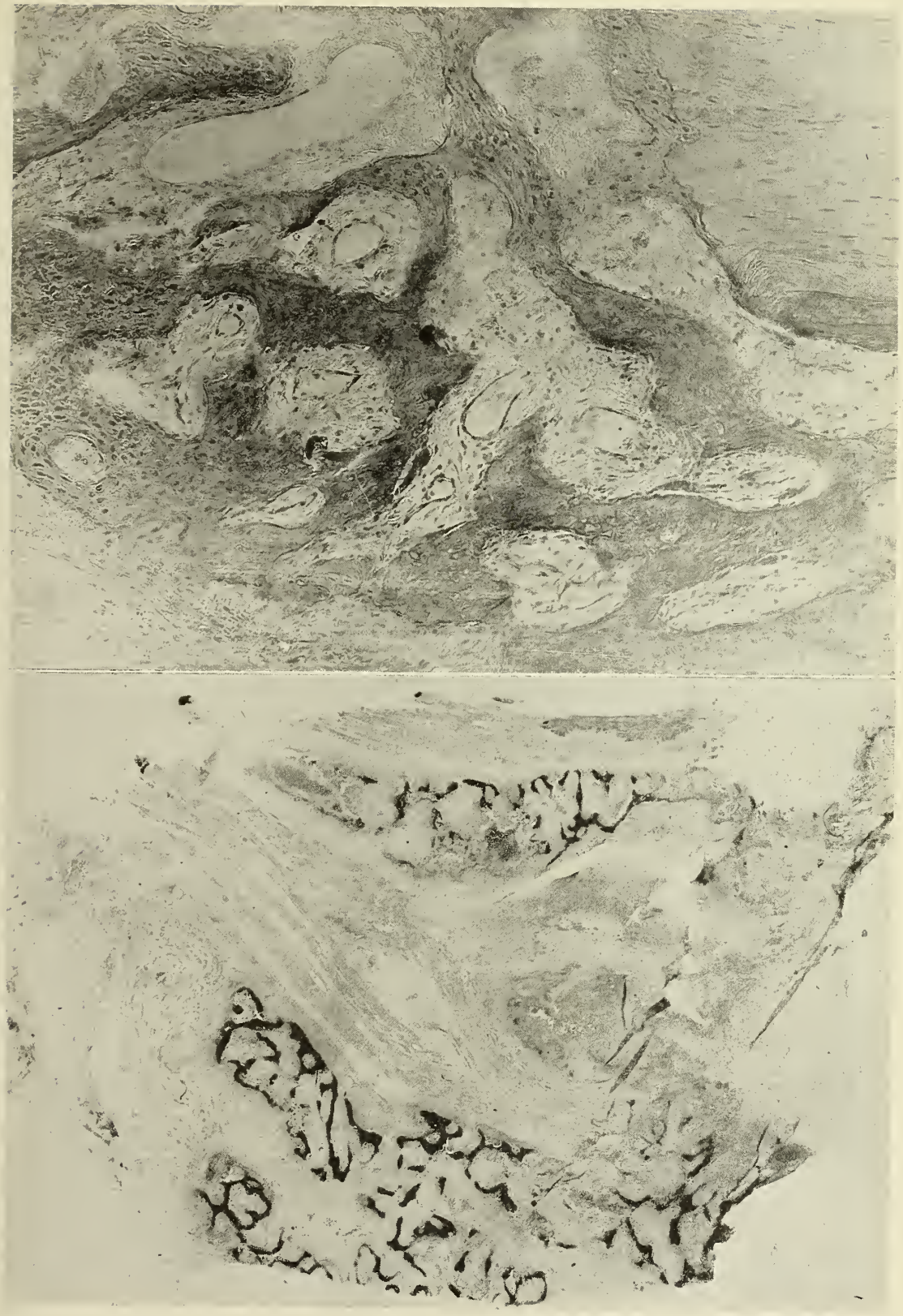


Fig. 19 (*above*). Late callus about broken end of bone.

Fig. 20 (*below*). Fractured human femur, 28 days. Considerable motion at fracture site. Tissue removed at operation from between bone ends.

the relative proportions of diffusible and non-diffusible calcium present in the blood stream.

Having considered these points, another series of observed facts appears which are upsetting. If we are to regard osteoblasts as specific, certainly we must so regard cartilage cells. At the site of fracture in the shaft of an adult long bone there is surely no cartilage, and yet callus in its formation, as one can see from our sections, contains bone laid down both in cartilage and in connective tissue. More than that, the bone form of matrix with the cartilage type of cell exists in callus—an association hard to correlate with a specific osteoblast, since morphologically no cells even remotely resembling osteoblasts are present, and yet bone is present. We call to mind also the lack of any distinctive cell type in many of these sections. The cell type has apparently little correlation to the type of intercellular substance.

At different times we note active bone formation in tissues far removed from bone as the result of injury, disease, or chronic irritation. Under the microscope this is morphologically real bone with Haversian canals, not a mere calcification. It is found in chronically inflamed and fibrotic tonsils, in abdominal scars, and in the late stages of arteriosclerosis in the outer walls of the vessels where run the vasa vasorum. It is also found following trauma to muscles, as the so-called traumatic myositis ossificans (in the true case it has no connection with bone), and it is found in the form of rider's bone. Experimentally it is produced by numerous methods. If we tie off the intrinsic circulation of a rabbit's kidney, leaving only the capsular supply with or without omental aid, we will get true bone formed in a certain percentage of cases. Neuhof[16] has secured it in fascia lata transplants into the bladder wall. The only constant factor in all these instances of abnormally situated bone formation is a circulatory disturbance, with some death of tissue. If we hold to a specific osteoblast we must then believe that these abnormal sites for bone production are the results of the activities of osteoblastic rests of fetal origin, or that under certain indefinite conditions of which we know only two constants—circulatory disturbance and slow tissue death—ordinary fibrillar connective tissue cells may by metamorphosis become osteoblastic in function. The why and wherefore of that metamorphosis is beyond our ken.

To go back to our non-union for a moment. When other means fail, Bier's hyperemia sometimes succeeds—this is essentially the introduction of an artificially produced vascular disturbance into the picture—and, just as in tying off the vessels of a rabbit's kidney, sometimes it works and sometimes it does not. Nor have we any means of telling just which result is going to be effected in any given case. When all other means fail we are driven to operative procedure, the most effective method being some form of bone graft. If we hold to a specific osteoblast or an oseteoblast by metamorphosis it stands to reason that we must believe we are transplanting live osteoblasts, or are creating conditions favorable for the metamorphosis of osteoblasts from connective tissue cells, or both. Some things we know we do by operating—we kill some bone by trauma, we invade the soft parts which in healing produce granulation tissue and we change the circulatory status.

We can now take up some of the more recent observations on the bio-chemistry of this process. The work of Wells,[17, 18] Howland,[19, 20] and others has established many apparent facts in connection with the blood and tissue calcium and phosphorous content in health and disease. It has also been shown that hyaline cartilage in the presence of calcium inorganic salts shows a marked avidity for the adsorption of these salts. It has been shown also that under proper P^H conditions these calcium salts can be caused to precipitate or deposit in the hyaline matrix. Watts[21, 22] has shown that the form in which calcium exists in bone, a homogeneous mass, is entirely different from the form in which calcium appears when precipitated from solution *in vitro*. By alterations in the P^H it has been observed also that calcium in colloid combination can be deposited from that combination without any cellular activity. Bassett[23] has indicated a complicated organic calcium combination of large molecular size, which contains calcium and phosphorus with carbonate attached as CO_2 and which he calls hydroxyapatite. He has shown that this compound is capable of stability in both blood and tissues. Robison,[24, 25] of England, has produced evidence to show that in calcium compounds showing this same adsorption into

cartilage the precipitation of the calcium in the cartilage may be induced by the activity of a phosphatase or esterase which by splitting a hexosephosphoric ester frees phosphoric acid and may therefore bind the calcium. Moreover, it is conceivable that by alterations in the P^H of the medium in which this reaction takes place, it can be slowed up or stopped. All ferments, as we know, are active to their full extent only in the presence of a certain P^H. Altering that P^H will slow up the ferment activity or even stop it, so that the normal absorption of calcium which constantly goes on under those circumstances might even exceed the amount of calcium deposition and decalcification of bone might occur. Not infrequently we clinically observe such decalcification—here is a much more logical and simple explanation of it than any that can be given under our osteoblastic theory of bone origin.

Considering all these factors, it becomes apparent that if we are to disregard cell activity we have to consider what could vary the local P^H in order to explain failure of calcification, slowness of calcification, normal calcification and even decalcification. It becomes apparent that we have a single explanation of all these phenomena within our grasp. As we have pointed out, the one constant factor in the production of bone by injury, disease or experiment is circulatory change. We have seen also that the one constant factor in the recognized forms of treatment for delayed and non-union has been circulatory change. It is logical to feel that both qualitative and quantitative local blood supply changes will induce local P^H changes. Experimentally this has been shown to be true (by the use of quinhydron or hydrogen electrodes in the tissues and a string galvanometer as a potentiometer to record changes in potential) in acute inflammatory processes in the soft parts. It requires little change in P^H, however, to affect ferment activity, and the slight changes necessary are unmeasurable accurately in the tissue fluids by our present means because of the range of instrumental error, as well as the discrepancies due to purely physical causes such as muscular contractions, circulation, etc. We can say, however, with reasonable certainty, that quantitative and qualitative change in the circulation locally very possibly may induce local changes in P^H, even when slight in extent. Here, then, may lie one phase of our story. Dependent upon the circulatory status of the soft parts, in the bone and in the adjacent tissues as well, will depend the P^H of the granulation tissue produced from those soft parts. On that P^H will depend whether ferment activity is normal, slow or absent—that is, whether calcium deposition is normal, giving union; or slow, giving delayed union (if slightly in excess of the normal absorption process which is constantly going on) or non-union (if it just about keeps pace with this absorption); or whether actual decalcification occurs because there is no calcium deposition occurring to offset even the normal absorption process in the bone. The ferment production may be the result of tissue death—and results wherever a certain amount of connective tissue death occurs.

Why, then, if the blood calcium and phosphorus are normal, does not calcium deposition as bone occur more frequently where there is tissue death with circulatory disturbance?

On this point I will cite work[7] which is now in progress, in so far as it has gone.

If we resect 2.5 cm. of a dog's radius and throw it away, leaving the gap in bone to heal as it will, we get a fibrous union filling the gap between the two bone ends with a little ossification just adjacent to the bone ends where we have killed some little bone by our operative procedure.

If, instead of discarding the resected portion, we remove all periosteum and endosteum and break it up into chips and place *them* in the gap, we get a solid bony union, although, as we have seen from our sections, these bone chips are dead and are autolyzed, at least in part.

If, to make sure of their death, we boil the fragments before putting them back, we get bony union notwithstanding.

If we decalcify these fragments before we put them back, *we get no evidence of bony union.*

Obviously, viability being disposed of as a factor, and everything else except the calcium being disposed of as a factor, the rôle of these bone chips seems to be to supply calcium for the calcification of the granulation tissue constituting the healing process.

Therefore, I have resected in other dogs the same amount of radius, discarded the fragment and placed in the 2.5 cm. gap powdered sterile $CaCO_3$ and $Ca_2(PO_4)_3$—supplying an artificial source of calcium in the gap previously filled by bone—and *solid bony union has resulted.* Similar

procedure using sterile powdered calcium hexose phosphate has again given solid bone in the 2.5 cm. gap.

If, before putting in the calcium, some of the dog's blood was defibrinated and the fibrin placed in the gap, the union was more rapid. As control animals with merely the fibrin placed between the fragments gave fibrous union, we can conclude that the rôle of the fibrin is merely to aid in the more rapid organization by granulation tissue. It is possible also that the fibrin has a similar affinity for calcium to that of the hyaline of cartilage. The hyaline of cartilage and the collagen of new-formed connective tissue are very closely allied chemically, and such affinity in collagen has been shown to exist. Such an affinity in the fibrin would tend to hold the calcium for local use and to prevent its dispersion by the local circulation.

Here, then, we may have good logical reason for the occurrence of these delayed unions, nonunions and decalcifications, even in the presence of normal P and Ca. The calcium source for calcification of the granulation tissue is local and is the dead bone at the site of fracture, autolyzed by ferments set free or activated by tissue death and held in situ by the affinity of fibrin (?) and the collagen of granulation tissue and deposited in that granulation tissue to form bone by another ferment activity, that of a phosphatase being used purely as an example. The vital process would then be ferment activity in the presence of a local calcium source, and the completeness or failure of the process would depend upon the local P^H of the tissue fluids induced by the local circulatory status. On this basis bone formation would not occur in soft parts where tissue death and circulatory disturbance co-exist unless there were a local concentration of calcium at the site (regardless of what the blood phosphorus or calcium might be) and unless the circulatory change were such as to produce proper tissue fluid P^H conditions. The factors which might cause local concentration of calcium in an isolated soft part region, thereby providing the local calcium source, remain to be determined. It has been shown that the growth of certain bacteria in the soft parts can induce such a local calcium concentration. This and other factors capable of doing the same thing are under investigation.

The possible conclusions we may draw from the material herein presented are as follows:

1. Fractures always heal, unless there is a mechanical bar to tissue growth.

2. The healing is accomplished as with wounds elsewhere by the growth of granulation tissue.

3. This granulation tissue is derived from the wounded soft parts of the bone—periosteum, endosteum—and the areolar tissue about the vessels in the marrow cavity and elsewhere. If there is tearing of the periosteum it is derived from the soft parts about the bone as well, in proportion to the access allowed them to the fracture site. Sometimes the major part of this granulation tissue comes from the soft parts about the bone.

4. Delayed union is a failure of the healing tissue to calcify at the average rate.

5. Non-union is a failure of the healing tissue to calcify at all.

6. The source of calcium for this calcification is dead and autolyzed bone at the site of fracture and not the blood stream.

7. Vascular changes probably induce local tissue P^H changes which may strongly influence precipitation of calcium salts from solution or colloid combination or ferment activities on large radicles of organic calcium salts—such as hydroxyapatite or calcium hexose phosphate.

8. Given tissue death, a local calcium source, a vascular status producing the proper P_h, and granulation tissue, bone will form without the presence of any bone cell.

9. Bone as a calcium source can be experimentally replaced by both inorganic and organic salts of calcium (hexose phosphate). Either precipitation or ferment splitting activity may be responsible for the calcium deposition; the latter seems the more probable.

10. Bone and soft part circulation are of prime importance in the process of calcification of fracture healing and should, therefore, be prime objects of attention *early in the bone healing process.* The time to use elevation, heat, massage, diathermy and active exercise is at that time, if possible; it is much more important than later in the course.

11. Mouth administration of Ca, P and similar drugs is ineffective. If calcium is needed it must be supplied locally and not via the blood

stream in any individual whose general calcium metabolism is normal.

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SYMPTOMS AND COMPLICATIONS OF CHRONIC URINARY OBSTRUCTION*

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STRANGE as it may seem, one of the commonest human ailments is also one that is frequently overlooked; namely, hypertrophy of the prostate gland. One would naturally think that a condition so easily diagnosed on rectal examination would scarcely ever be missed. Failure of diagnosis occurs, in most cases, either because of the absence of any urinary symptoms, or because the prostatic obstruction is confined to the intravesical portion of the gland so that rectal examination gives negative results.

One would infer that in cases in which the prostatic obstruction is sufficient to cause considerable retention of urine, the patient would be aware of some urinary symptoms which would call attention to the condition. However, this is frequently not the case, since it is not at all uncommon to find residual urine to the amount of 500 c.c. or more without the patient being aware of its presence, and with no urinary disturbance noticeable to the patient. Probably the increase in residual urine is so slow and insidious that the patient is not aware of any additional discomfort. It is surprising how the human system will accommodate itself to the presence of a large amount of residual urine and how all other functions proceed as regularly as though nothing had happened. Apparently, however, there is a limit to the amount of urine which can be retained in the bladder without causing disturbance of renal function. This limit probably varies considerably in different persons, depending on a variety of factors, chief of which probably is the degree of protection against back-pressure offered by ureteral peristalsis and the ureterovesical mechanism. When this barrier has been broken down and the function of the kidneys is interfered with, symptoms arise which are not referred to the urinary tract but which are included in the wide range of symptoms accompanying renal insufficiency.

Among the secondary symptoms more commonly observed are anorexia, nausea, vomiting, headache, dizziness, loss of weight, general weakness, and other signs of constitutional disturbance. Therefore, when a male patient aged more than forty years comes to the physician with headache, loss of appetite, occasional nausea or even vomiting, with pain referred to the epigastrium, or with such symptoms as backache and gradual loss of weight, it behooves him to make a rectal examination in the course of the general examination, and to determine whether there is any evidence of prostatic enlargement or other evidence of urinary retention. The complete medical examination in every case, and particularly in the adult male, should include a rectal examination, and unless this is made as a routine, many clinical conditions will remain undiscovered. It is curious that there should be an apparent prejudice against rectal examination, when by it data are so easily discovered which may be of such fundamental importance in ascertaining the cause of symptoms.

It is not at all uncommon in my experience to observe patients concerning whom a previous clinical diagnosis of nephritis has been made and in whose cases the results of general examination and the laboratory data suggest advanced nephritis. Many of these patients have been placed on antinephritic treatment, including dietary precautions, for months before the true condition is recognized. The similarity between the clinical data observed in cases of nephritis and those in renal insufficiency resulting from urinary retention, often is striking. Anorexia, nausea, loss of weight, weakness, headache and dizziness are common to both conditions. The data obtained on urinalysis are usually similar. The total output of urine in twenty-four hours is usually more than 2,000 c.c. in both conditions, and the specific gravity is usually low, averaging from 1.006 to 1.010. The excretion of phenolsulphonephthalein in two hours is often

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only a trace, with marked delay in time of appearance. As estimated, the blood urea and blood creatinine are usually markedly elevated; of the former often there are more than 100 mg. and sometimes more than 200 mg. for each 100 c.c. The blood pressure is usually markedly elevated; a systolic pressure of 200 mm. of mercury is not an uncommon occurrence.

Among the most valuable methods of clinical differentiation is the ophthalmoscopic examination. Characteristic retinal changes would almost necessarily be present with nephritis sufficiently advanced to cause clinical signs, such as those described. However, when urinary retention is the underlying factor, marked retinal changes are usually absent.

As an illustration of this differentiation may be mentioned a case which came under my observation not long ago. In the course of general examination the examining physician found clinical data which led him to believe that the condition was one of nephritis. An ophthalmologist was called in to make a retinal examination and when he had finished said, "This patient does not have nephritis; he has enlargement of the prostate gland." He arrived at the conclusion purely by differentiation, realizing that a patient with clinical evidence of advanced nephritis, and with normal eyegrounds, could hardly have anything else than urinary retention to account for his condition.

An interesting feature in the differentiation of nephritis and the insufficiency of renal back-pressure is the frequent absence of parallelism in renal back-pressure between the retention and excretory renal functional tests. As a result of interference with renal drainage caused by back-pressure, the excretion of dyes, such as phenolsulphonephthalein, is greatly diminished. It is not uncommon to find that only a trace of phenolsulphonephthalein has been excreted two hours after its intravenous injection, giving the impression of widespread renal destruction. On the other hand, retention tests may show that the blood urea is only moderately elevated and the blood creatinine may be practically normal. In contrast, there is usually closer parallelism between the excretory and retention tests in nephritis. If, in a case of evident renal insufficiency, there is any question as to the predominant etiologic factor, differentiation can be made by renal functional tests following drainage of the urinary tract. If the renal insufficiency is temporary and is caused by urinary retention, the laboratory data will undergo a great change when drainage is reëstablished. First to improve will be the blood urea, which may drop 30 or 40 mg. within a week. The excretion of phenolsulphonephthalein gradually will improve, and in the course of several weeks will approximate normal. How different the picture is with true nephritis or when the kidneys are permanently injured. It is then only with great difficulty that the blood urea can be reduced, and the excretion of phenolsulphonephthalein may remain but slightly improved, in spite of every effort.

It is strange how frequently patients present themselves with symptoms referable to the alimentary tract entirely. It is not uncommon for patients to give a history which can easily be regarded as typical of gastric carcinoma, such as vomiting, epigastric pain, loss of weight and cachexia, all of which can be explained by renal insufficiency secondary to urinary retention. It is curious that many patients with prostatic hypertrophy will also complain of considerable constipation. Whether the enlargement sometimes acts as a mechanical factor in the rectum or whether it is a reflex phenomenon from irritation in the prostatic region is difficult to determine.

The physical evidence of urinary retention other than that which may be obtained from prostatic enlargement must be considered. One might think that an overdistended bladder could be made out rather easily on abdominal palpation. However, this often is not the case. It is surprising to what extent the bladder may be distended and still be difficult to discover on either abdominal or rectal palpation, or by percussion. When there is an evident abdominal tumor in the median suprapubic region, one must, of course, infer vesical overdistention, bearing in mind, however, the other abdominal conditions which may cause tumor similarly situated. The bladder, however, does not always distend uniformly, so as to cause a symmetric tumor in the median suprapubic region. In fact, it happens frequently that there is unilateral enlargement of the bladder, for half of the musculature of the bladder may give way and that half may be-

come distended, while the remaining portion of the musculature of the bladder hypertrophies. As a result of this, the tumor may be felt entirely in either the right or left lower abdominal quadrant. I distinctly recall a case of this kind in which a surgeon had felt a cystic mass in the lower right quadrant of the abdomen and had advised immediate operation for abdominal tumor. Although the patient did not have urinary symptoms and although on rectal examination there was little, if any, prostatic enlargement, the tumor disappeared on introduction of a catheter into the bladder.

One might expect that examination of the urine would call attention to the presence of urinary retention. However, in many cases of retention, urinalysis gives negative results or reveals, at most, occasional leukocytes or erythrocytes. Needless to say, the presence of even a few cells should always lead to further investigation of the urinary tract. With prolonged urinary retention of marked degree, there is usually definite reduction in specific gravity, which also might call attention to possible involvement of the urinary tract.

Of greater value would be the evidence obtained by renal functional tests. As the result of prolonged renal back-pressure there is often excretion of only a trace, or an extremely low percentage, of phenolsulphonephthalein, and with the low excretion of dye the blood urea is usually distinctly higher than normal. There is lack of parallelism between the retention and the excretory tests because the amount of the dye excreted is not a true index of the secretory power of the kidney. Because of the back-pressure of the retained urine there is failure of excretion of the dye rather than failure of secretion. Frequently, the blood urea is raised only to a moderate degree, whereas the excretion of phenolsulphonephthalein is markedly reduced.

It must be emphasized that urinary retention cannot be excluded because evidence of prostatic enlargement is not felt by rectum. The following conditions may be present even though rectal examination gives negative results: (1) prostatic obstruction confined to the intravesical or median portion of the gland; (2) disturbance of innervation of the bladder, usually resulting from disease of the central nervous system, or (3) diverticulum of the bladder.

It is frequently surprising how much prostatic obstruction may be present in the intravesical portion of the gland in cases in which rectal examination reveals little, if any, enlargement. Such obstruction can be determined by means of cystoscopic examination only. The presence of retention in such cases may be surmised from the data previously described, and in case of doubt can be verified by catheterization. The degree of urinary retention is not commensurate with the degree of prostatic enlargement felt by rectum. Frequently, the prostate gland is comparatively small and still is so situated that the obstruction is great. Since the widespread use of the cysto-urethroscope, cicatricial contracture of the vesical neck also is being recognized as a common cause of urinary obstruction.

Another form of prostatic enlargement which has not been mentioned is prostatic carcinoma. This condition may be the cause of a variety of general symptoms without any subjective evidence of urinary obstruction. Chief among these is pain referred to various portions of the body. One of the commonest causes of so-called lumbago, sciatica or neuritis referred to the sacral or lumbar region or to either leg, is that caused by prostatic carcinoma. Many patients have been observed who have complained of pain referred to these regions, and of loss in weight or strength, but in whom the prostatic condition has been neglected because of absence of urinary symptoms. The abnormality of the prostate gland could be discovered only by rectal examination as a routine. It hardly would be necessary to describe the physical characteristics of prostatic carcinoma, since all are familiar with the peculiarly firm, nodular character of the gland.

Urinary retention resulting from disturbance of innervation of the bladder is common and may easily be overlooked. Such retention may be caused by disease in the central nervous system or by terminal neuritis. Although the former condition usually is accompanied by clinical evidence which would call attention to a lesion in the central nervous system, such data are often obscure, and in the early stages of the disease may be absent. On the other hand, retention existing with an evident lesion

in the central nervous system frequently is overlooked in the absence of urinary symptoms. It is peculiarly true, however, that in the presence of a lesion in the central nervous system, retention is more often present over a long period of time without causing evidence of renal insufficiency or urinary disturbance than it is in the presence of prostatic obstruction. As a result of dysfunction of the nerves supplying the bladder, the cystoscopic appearance is pathognomonic and gives a picture of the so-called cord bladder. Rectal examination in cases of this condition is often of diagnostic value. Instead of the normal prostatic fullness, a definite depression or flaccid condition of the rectal musculature in the prostatic region may often be discovered. On introduction of the finger, attention may be called to the possibility of disturbance in innervation by definite weakness of the anal sphincter and lack of muscular tonus in the rectal wall.

Another lesion which may cause considerable urinary retention is diverticulum of the bladder. Frequently the diverticula are multiple and may be even larger than the bladder itself, so that the resulting retention is of marked degree. Since the urine in cases of diverticula usually becomes markedly infected, the presence of diverticula should be suspected in every case of urinary retention with marked pyuria. Although there is usually more or less pyuria and dysuria in cases of diverticula, occasionally there are no symptoms referable to the urinary tract and on rectal examination there may be little, if any, prostatic enlargement. Diverticulum nearly always occurs secondary to some from of obstruction at the vesical neck, usually with enlargement of the prostate gland. Its diagnosis can be made either by cystoscopic examination or, better, by means of a cystogram which visualizes the diverticulum as a rounded area of sacculation extending laterally from the outline of the bladder. After the bladder is emptied, a subsequent roentgenogram usually will show that a considerable amount of the opaque medium has remained in the diverticulum.

A method which should be employed more frequently in general diagnosis, and which is easily available wherever there is roentgenographic apparatus, is cystography. The technic of making a cystogram is comparatively simple, and consists of emptying the bladder and then injecting several ounces of a solution of 5 per cent sodium iodide. Exposures are then made, from a right and from a left angle; the bladder is emptied, and a third roentgenogram is made. Not alone will diverticula be readily outlined by this simple method, but other deformity of the bladder, such as the elevation of the base that occurs with prostatic hypertrophy, sacculation, or deformity of the bladder, and filling defects which occur with intravesical or extravesical tumor may also be demonstrated. The method is a routine in every case of suspected urinary retention in the clinic.

In regard to the treatment of advanced urinary obstruction, it should be emphasized that when the bladder has been discovered to be greatly distended, it should not be emptied immediately. In fact, as soon as it is evident that a large amount of urine is being retained, it would be best to hospitalize the patient and gradually to empty the bladder. One of the favorite methods is by means of inserting an indwelling urethral catheter and elevating the receptacle into which the urine is emptied so that the bladder is gradually drained by the process called decompression. The bladder should not be completely drained in less than twenty-four hours; preferably as long as forty-eight hours should be allowed. It has recently been suggested that decompression can be accomplished equally well by gradually draining the bladder through a ureteral catheter of number 5 or 6 caliber. The treatment directed against secondary renal insufficiency consists largely of forcing fluids, both by mouth and intravenously, a diet low in protein, hot packs daily, and general care preliminary to removal of the obstruction.

AN ANOMALOUS EXTRA-VESICAL ORIGIN OF URETER*

Report of Case

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THE case to be reported is of unusual interest because of its bizarre nature, the great rarity of the condition presented, and the unique surgical problem peculiar to it.

A young woman, aged 25, was referred for urologic examination July 31, 1929. She complained of continual persistent drainage of urine from the region of the vulva. The exact origin of the drainage, whether from the urethra, vestibule or vagina, she did not know. The seepage of fluid had been persistently present since birth. Its rapidity was not influenced by coughing, straining or change of position. It was continuous day and night. It appeared, therefore, to lack the characteristics of urethral incontinence. Careful inquiry elicited no history of injury or surgical procedure to account for a traumatic vesico-vaginal fistula. Menstruation was normal.

These facts of history suggested the possibility of one of the rare anomalies of extra-vesical origin of a ureter (improperly referred to as termination of a ureter). With this in mind the detailed physical examination was designed to discover such an anomalous ureteral opening if present in the external genital region, or vagina, or to determine the cervix as the source of drainage, in case of origin in the uterus or a fallopian tube.

The patient was well developed and nourished. The temperature, pulse rate and respiration were normal. She did not appear ill. The general physical examination was quite negative. Only details pertinent to the condition complained of will be given.

There was no tenderness to pressure in either flank and no reaction to Murphy percussion. Neither kidney was palpable. No tenderness and no mass was discovered in the abdomen. The reflex reactions were present, normally active and equal on the two sides. Skin sensation was grossly normal and there were no areas of anesthesia or paresthesia.

Urinary tract radiographs showed kidney shadows of essentially normal size, configuration and position and no abnormality in other respects.

Urination was normal, the stream being of good size and force. There was no residual urine.

The skin about the genital region and inner aspects of the thighs was moist and slightly reddened. Careful inspection of the vulva and introitus disclosed no abnormality except wetness of the surfaces. The source of the moisture was not evident. The external urethral meatus was in normal position and of normal appearance. The urethra felt quite normal to palpation against the pubic arch. Para-urethral gland duct openings were present but each would admit a fine probe only a few millimeters. The vestibule and margins of the introitus were carefully searched with a fine probe but no abnormal opening could be found.

On bimanual pelvic examination a normal cervix, a freely movable uterine fundus in normal position, and normal adnexal regions were found. In the right lateral vaginal wall extending downward from the fornix was a flap-like ridge of vaginal wall. This structure became less prominent toward its lower end and disappeared altogether two or three centimeters from the introitus. With the patient in the knee chest position the vagina filled well with air permitting careful and complete examination of its whole interior. The cervix appeared normal. It was wiped dry and watched for several minutes. No fluid appeared at the os. The vaginal surfaces were searched with a probe, particularly the flap-like ridge on the right wall, but no opening was discovered.

On urethro-cystoscopic examination no anomalous ureteral meatus could be found in the urethra. The bladder neck and sphincter margin were normal. The bladder mucosa and contour were normal throughout. Both ureteral orifices were present, in normal position and were normal in appearance. Indigo-carmine, given intravenously, appeared promptly and in good concentration in each ureteral jet.

It was determined to let this temporarily conclude the examination.

*Case Presentation before the Minnesota Academy of Medicine, St. Paul, Dec. 11, 1929.

Upon removal of the cystoscope the vestibule was sponged dry and re-inspected. Suddenly the mucosa just to the right of the urethral meatus became wet. Grossly, no opening indicating the source of the fluid was evident. However, a fine urethral catheter, used to probe the region, finally slipped into a minute opening. It was situated on the vestibule one-half centimeter to the right of the urethral meatus. The catheter was passed into the opening twenty centimeters. A radiograph made later showed the catheter to extend upward parallel to the position of the vagina. In the region of the bladder the catheter was coiled up in a space extending upward and to the right. The catheter could now be felt beneath the flap-like ridge in the right vaginal wall.

The cystoscope was re-inserted and a shadowgraph catheter was passed for the full length into the normal right ureteral orifice. The radiograph showed this catheter to occupy a normal position of a right ureter (Fig. 1).

The small catheter which had been introduced into the opening in the vestibule near the urethra was now injected with sodium iodide solution. The radiograph made following this (Fig. 2) showed it to outline very well a tract extending upward parallel to the vagina and a cavity in the region of the bladder in which the catheter was coiled up. Extending upward from this, the solution outlined a long narrow tract in the position of a right ureter and ended in the upper renal area in a bulb-like extension, characteristic of the high lying, rudimentary upper pelvis of a duplicated kidney. The catheter which had been passed into the normally placed right ureteral orifice within the bladder was now injected and another radiograph was made (Fig. 3). It showed this ureter well filled, of normal position and communicating with the lower pelvis of the duplicated kidney.



Fig. 1



Fig. 2



Fig. 3

The condition demonstrated was: Complete duplication of the right upper urinary tract with anomalous extra-vesical origin in the vestibule of the ureter draining the upper pelvis.

This condition represents an anomaly of the upper urinary tract—in fact, two anomalies: (1) the complete duplication of pelvis and ureter due to an anomalous cleavage of the ureteral bud; (2) the extra-vesical termination of one ureter in the vestibule due to an anomalous persistence of the attachment of the ureter to the Wolffian duct permitting the ureteral orifice to be carried down with the downward shifting duct, so that either it comes to have finally its own separate opening on the surface or remains attached to the vestigial remnant of the Wolffian duct, Gartner's duct, and reaches the surface through this channel.

Anomalies of the upper urinary tract have been classified as anomalies of form, of number and of position. Such classification seemed to me purely arbitrary and without foundation in em-

bryology. Some time ago I submitted a new classification based upon the facts of embryology concerning the morphogenesis of these malformations.

CLASSIFICATION OF UPPER URINARY TRACT ANOMALIES

- KIDNEY (*Renal Blastema*)
  - Position
    - Under-rotation
    - Over-rotation
    - Ectopia
    - Incident to Malformation
  - Form
    - Fusion
      - Horseshoe
      - Tandem
      - Lump
    - Infantile
    - Absent
    - Polycystic?
- URETER AND PELVIS (*Wolffian Duct*)
  - Cleavage
    - Partial Duplication
    - Complete Duplication
  - Origin
    - In Bladder
    - In Urethra
    - In Genital Tract
    - In Vestibule
    - In Rectum
  - Structure (Narrowing)
    - Calyx
    - Ureter
    - Uretero-Vesical Orifice
- BLOOD VESSELS
  - Division
  - Number

According to this classification anomalies of the upper urinary tract have been grouped as:

1. Anomalies of the secreting structure, the kidney proper, derived from the renal blastema.
2. Anomalies of the excreting structure, the ureter, pelvis, calyces and collecting tubules, derived from the Wolffian duct.
3. Anomalies of the renal vascularization.

The first group, anomalies of the kidney proper, result from faulty development in the renal blastema and from abnormality in the ascent and rotation of the kidney derived from this structure. The anomalies of form, such as horseshoe kidney, lump kidney and possibly polycystic kidney, and anomalies of position, such as ectopic kidney and under-rotated or over-rotated kidney of the old classification, fall into this group.

The second group, anomalies of the ureter, pelvis and calyces, result from faulty development in the ureteral bud arising from the Wolffian duct. The "anomalies of number" of the old classification, frequently spoken of as duplicated kidneys, fall into this group under the heading "cleavage anomalies." These are due to premature cleavage of a single ureteral bud or the formation of two buds.

Anomalous origin of the ureter was not taken into account under the old classification. Such anomalies are due to failure of the ureteral bud stalk to be dropped off in its normal definitive position in the bladder. Instead its attachment to the Wolffian duct persists abnormally long or permanently and permits it to shift downward with the Wolffian duct to open below the level of the bladder. This occurrence provides opportunity for origin of the ureter in the urethra in both sexes, in the common ejaculatory duct of the male or in Gartner's duct, or in the vestibule of the female. When it is combined with other departures from normal, it may give rise to origin of the ureter in the rectum of either sex, in the seminal vesicle or vas deferens in the male and to origin in the fallopian tube, uterus or vagina in the female.

Abnormal structure in the form of narrowings of the excreting channels developed from the ureteral bud gives rise to congenital strictures. They may affect the excreting channels anywhere from a calyx within the kidney to the ureteral opening in the bladder mucosa. They have been grouped under "structure."

The third group, anomalies of the renal blood vessels, occur as abnormal divisions and distributions of an otherwise normal renal artery or vein or as supernumerary vessels originating from aorta or cava or other neighboring vessels.

In the case reported, the cleavage anomaly, consisting in complete duplication of pelvis and ureter, obviously is due either to two ureteral buds having formed on the Wolffian duct or to the premature division of a single ureteral bud.

Under normal development, that portion of the Wolffian duct between its opening into the bladder or cloaca and the point of origin of the ureteral bud, spreads into the expanding bladder wall until the stalk of the ureteral bud is reached. The latter then shifts onto the bladder as a separate opening, its definitive position in the bladder being thus established. The expanding bladder

wall carries this ureteral opening lateralwards, and upwards relative to the now separate Wolffian duct opening in the bladder. In addition there is a medial, and downward shifting of the latter opening which further contributes to this relative position of the ureteral orifice and the continuing attachment of the Wolffian duct to the bladder.

Should there have been two ureteral buds, the stalk of the first one, the lower one, will first meet the bladder and shift onto it as the ureteral opening of the lower pelvis. The second stalk continuing its attachment to the Wolffian duct usually meets and shifts to the bladder before the duct attachment is below the position of the vesical neck. This stalk, representing the ureter of the upper pelvis, however, will have been carried by the Wolffian duct into a position more medial and lower than the opening of the ureter of the lower pelvis. Thus it is that the lower medial ureteral orifice in the bladder of a complete duplication, drains the upper pelvis, while the upper lateral orifice drains the lower pelvis.

In the case of a complete duplication arising from the premature cleavage of a single ureteral bud instead of from two buds, it must be presumed that the stalk of the ureteral bud either alone, after shifting to the bladder as a separate opening, or together with the Wolffian duct before this occurs, goes through this same process of spreading into the expanding bladder wall until the point of ureteral bifurcation meets the bladder wall, whereupon, in succession, first one and then the other division of the ureter will shift to the bladder as separate openings.

In the case reported, the anomaly of origin of the ureter, extravesically in the vestibule, is due to the upper ureteral bud stalk (if there were two ureteral buds) or the upper division of a bifurcated stalk (if there was premature cleavage of a single ureteral bud) failing to shift to the bladder as a separate opening, as did the ureter of the lower pelvis. Instead its attachment to the Wolffian duct either persists abnormally long or is permanent. In the first case it would represent a downward carriage by the Wolffian duct of maximal extent to the vestibule, finally shifting to this site as a separate opening. In the second case it would represent a permanent attachment of ureter to Wolffian duct which reaches the surface via the vestigial remnant of this duct as a patent Gartner's duct.

The case reported presents a unique surgical problem peculiar to such conditions. In cleavage anomalies of the upper urinary tract there may be no symptoms and no associated pathologic change. Under these circumstances there is no indication for treatment, surgical or otherwise.

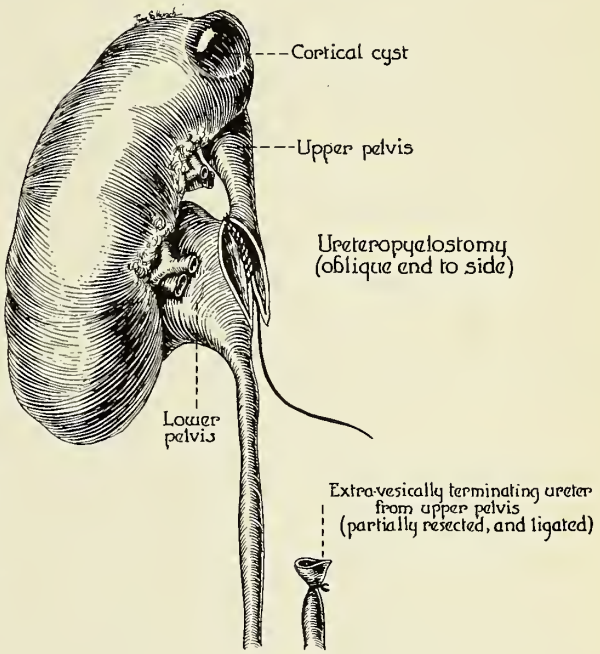


Fig. 4

Frequently, however, the anomaly is present in association with an obstructive lesion and there may be dilatation, persisting infection or stone formation, or tuberculosis or neoplasm may be present. Under these circumstances the problem of surgical treatment is rendered unique and peculiar because of the associated anomaly. In general, the major surgical procedures which come up for consideration are, nephrectomy, hemi-nephrectomy and finally the possibility of anastomosis between the two divisions of the double kidney.

Anastomosis between the two divisions is useful as applied to obstructive lesions affecting one division of a duplicated upper urinary tract, the anastomosis providing drainage for the obstructed division through the ureter of the unobstructed division.

By hemi-nephrectomy it may be possible to remove the diseased half of the double kidney, thus preserving the function of the undiseased half. In my own experience, hemi-nephrectomy has been employed four times, in all cases with

an excellent functional result. In a fifth case, hemi-nephrectomy was undertaken but because of the particular vascular arrangement and the extensive changes of a suppurative calcareous pyonephrosis involving the lower division of the kidney, the procedure had to be abandoned in favor of complete nephrectomy. The experience with hemi-nephrectomy which has been mentioned is a particularly fortunate one and such results with the procedure cannot be regularly expected. It has many undesirable features, among which may be mentioned great technical difficulty because of the particular vascular arrangement, the danger of immediate or secondary hemorrhage from the sutured cut surface of the remaining portion of kidney and urinary fistula or chronic recurring accumulations in the wound due to remaining portions of the parenchyma which had drained into the removed pelvis.

Anastomosis between the two divisions of the duplicated upper urinary tract avoids the dangers of hemi-nephrectomy, and when conditions are suitable for its employment it is a much more desirable procedure than hemi-nephrectomy. My first operation of this sort was employed more or less as a makeshift means out of a technical difficulty. The result was excellent. My first impression that this was the first operation of the kind to have been employed was incorrect. A year or so following this first operation the same procedure was carried out in a second case with an equally satisfactory result.

In the case reported, relief of the persistent extra-vesical drainage of urine might be accomplished in various ways: total nephrectomy, hemi-nephrectomy, simple ligation of the anomalous ureter, transplantation of the anomalous ureter into the bladder, or by uretero-ureterostomy or uretero-pyelostomy between the two divisions of the duplicated upper urinary tract.

Certainly in this case the lower half of the kidney is well worth saving and conservatism contra-indicates total nephrectomy. Although the upper division is of very little functional importance its removal by hemi-nephrectomy is not indicated because of any pathologic change apart from the extra-vesical opening of its ureter. This undesirable functional procedure should not be undertaken because of the extra-vesical drainage, if this can be corrected by a safer procedure assuring an equally satisfactory functional result. Simple ligation of a ureter without removal of the secreting parenchyma which it drains may be employed as has been done when the ureter is inadvertently cut during hysterectomy. If the kidney is uninfected and complete atrophy promptly results from the complete obstruction of ligation, a favorable result may be expected. On the other hand, particularly in the presence of infection, serious difficulties may ensue. Transplantation of the ureter into the bladder is a technically difficult procedure and does not regularly give a good functional result, devoid of possible complications. The exposure is difficult and transplanting the ureter so as to provide a competent uretero-vesical valve is not easy. A uretero-vesical anastomosis which does not provide against intra-vesical pressure being conducted into the ureter assures damage to the kidney above and provides an excellent probability for ascending infection and complications of real consequence.

The above considerations indicate transplantation of the anomalous ureter into the lower pelvis or ureter as the operation of choice in the case reported. Accordingly uretero-pyelostomy as illustrated (Fig. 4) was performed. The segment of ureter between the point of anastomosis and the brim of the bony pelvis was resected.

The patient made an uneventful convalescence and now more than three months since operation she remains entirely relieved of her distressing symptoms without any pain referable to this upper urinary tract or urinary disturbance of any sort and in all respects is quite well.

CORONARY OCCLUSION WITH SURVIVAL*

James A. Evans, A.M., M.D.
La Crosse, Wisconsin

CORONARY occlusion is most often a dramatic cause of fatality, but that many cases do survive is becoming more universally recognized as the clinical picture is becoming more familiar. Herrick[1] recognized this fact as far back as 1919 when he classified coronary thrombosis cases as follows:

1. Cases of instantaneous death in which there is no death struggle.
2. Cases of death within a few minutes or hours after obstruction.
3. Cases of severity in which death is delayed for several hours, days or months, or recovery occurs.
4. A group that may be assumed to exist embracing cases with mild symptoms; for example, a slight precordial pain ordinarily not recognized as due to obstruction in the smallest branches of the coronary arteries.

Only three articles, in the enormous amount of literature which has recently sprung up on coronary occlusion, have been devoted entirely to the consideration of these milder cases with recovery.

Luten[2] reported three cases in 1927 which survived one year five months, one year six months; and one year, ten months, respectively.

Levine,[3] in 1925, reported five cases with survival to the time of writing of from eight months to one year ten months.

Pardee[4] reported one case living up to time of publication in 1927, three years and three months.

Hamburger,[5] in an article not devoted exclusively to cases with recovery, reports he has seen several cases that have led fairly active lives for a period of five years or longer, giving no specific figures.

Willius[6] makes a statement that one-half the cases of coronary occlusion die immediately, and one-half survive a few days to months, or even years.

The reason for survival lies in the fact that only a small vessel may become occluded and, therefore, only a small area of heart muscle be infarcted; or, granted that a large area be infarcted, the capillary anastomoses are capable of establishing a collateral circulation to maintain nourishment to prevent a fatal thinning, scarring and final rupture of the ventricular wall. Indeed, such a rupture is sometimes the late result of an old infarction from which the patient may have survived a considerable length of time.

Wearn[7] has demonstrated beautifully the capillary bed of the heart and anastomoses formerly thought to be non-existent in the coronary circulation (Fig. 1).

A brief review of the clinical picture of coronary occlusion is presented below:

SYMPTOMS OF CORONARY OCCLUSION

Subjective

Often history of preceding attacks of true angina pectoris with normal electrocardiogram and no nitrite relief.

Terrible agonizing pain in precordium radiating down left arm.

No relief from nitrites or morphine.

Fear of impending death.

Vise-like choking feeling.

Objective

Age over 55.

Patient in shock.

Cold, clammy forehead and extremities.

Irregular rapid pulse.

Change in heart tones.

Murmurs, later pericardial friction rub.

Fever.

Slight leukocytosis.

Low blood pressure.

Pulmonary signs.

Changes in electrocardiogram.

The electrocardiograph affords the best confirmatory evidence when the so-called Pardee's phenomenon[8] is present. This change occurred in seven of our ten cases. Other suggestive changes, especially if known not to exist before, were: auricular fibrillation (1

*Presented before the Southern Minnesota Medical Association, Winona, Minnesota, June 15, 1929.

case), bundle branch block (2 cases), slurring or notching of QRS complexes (1 case).

Pardee has called attention to a fairly characteristic electrocardiographic sign illustrated in some of these curves. The S-T takes off the R-wave in one or perhaps two of the leads above or below the iso-electric point and is convex upward to curve downward into a negative T-wave. When found, this sign is very suggestive but does not occur in all cases. Wearn[9] concludes: "It is obvious there is no one form of the electrocardiogram characteristic of this condition." Only one out of ten cases reported by him had Pardee's typical sign. Clark and Smith[10] state: "No alteration of the T-waves in coronary thrombosis has been accepted by the many writers as characteristic. For clinical purposes this change consisting of elevation of the T-wave which branches from the R or S limb may be considered as strong presumptive evidence of coronary occlusion." Fred M. Smith[11] showed the electrocardiogram of a dog with typical inversion of T1 and T2 with convexity of the S-T interval following ligation of the coronary arteries.

Our case reports call attention again to the frequency of coronary disease and angina pectoris in physicians—three in our small series of ten cases. Survival in our longest case so far has been five years and two months, and this patient subsequently died of cerebral hemorrhage. Seven of the cases have so far survived more than two years, and nine of the ten cases more than one year.



Fig. 1 (Wearn)

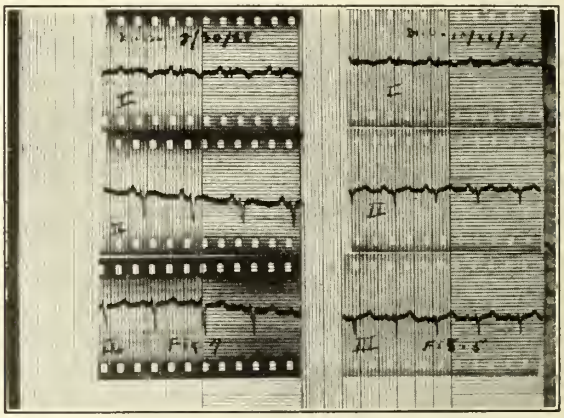


Fig. 4 Fig. 5

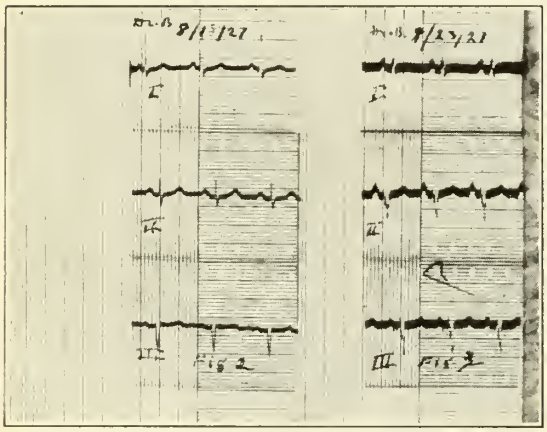


Fig. 2 Fig. 3

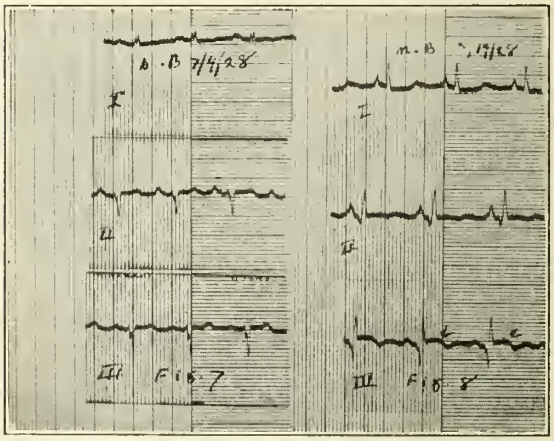


Fig. 6 Fig. 7

CASE REPORTS

Case 1.—Dr. B., male, aged 69, experienced a mild precordial pain while hunting. His electrocardiographic tracing was normal (Fig. 2) the morning of the same day infarction occurred. That night, and for the next week, he presented all the classical signs of coronary infarction enumerated earlier in this article. Four days after infarction TI had become flat (Fig. 3), but

not until twelve days after occlusion did Pardee's phenomenon occur (Fig. 4).

Note in Figure 4 that S-TI is above the iso-electric line and TI has become negative with the S-T interval convex upward. Two months later the patient had resumed normal activity. The tracing then showed (Fig 5) improvement in an upright T2. A year after infarction (Fig. 6), Pardee's phenomenon has disappeared, but TI is still flat. He has no more pain but a tendency toward congestive heart failure when too active.

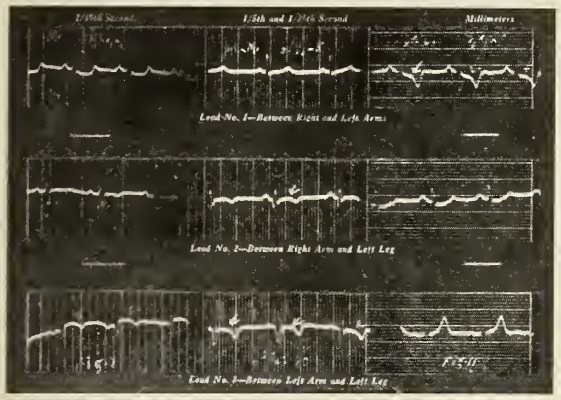


Fig. 8

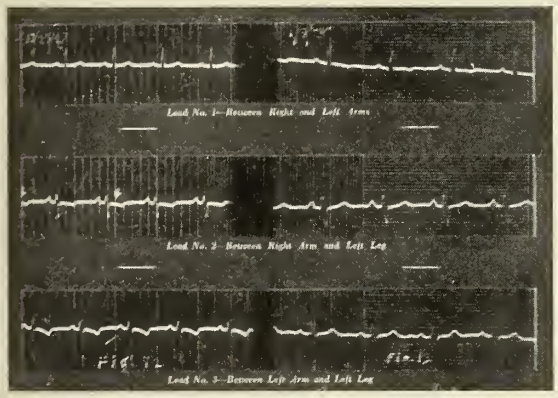


Fig. 9

Fig. 10

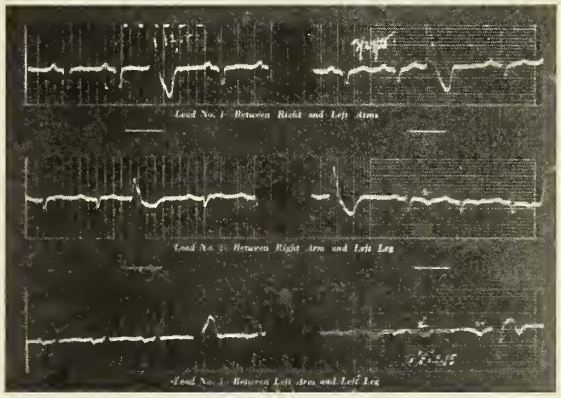


Fig. 13

Fig. 14

Fig. 11

Fig. 12

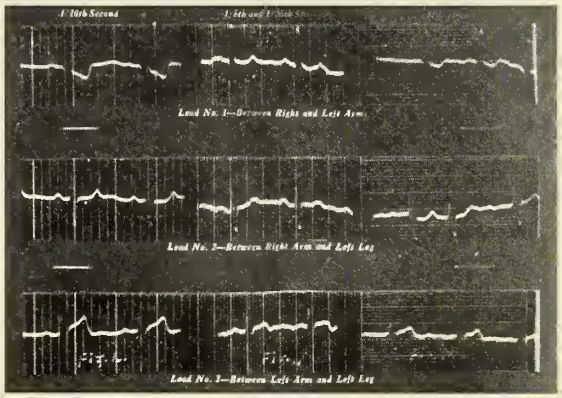


Fig. 15

Fig. 16

Fig. 17

Case 2.—Angina is notably absent in congestive failure as shown by our second case, a woman of sixty-four, who died two years after her occlusion with pulmonary edema and general anasarca. She had repeated attacks of angina till congestive failure set in, with Pardee's sign in the electrocardiogram (Fig. 7). After that, she was free from pain till compensation was restored, when attacks of precordial pain recurred. Subsequently, a second and final period of decompensation brought relief from pain.

Hamburger[5] indeed reported three patients who suffered but very little pain but died of congestive myocardial failure based on coronary occlusion. In these cases the occlusion may be very gradual.

Case 3.—L. M., a female aged 62, had had gradually increasing dyspnea for two weeks previous to falling in a faint two days before the electrocardiogram was taken. No history of cardiac pain could be elicited. Physically she had marked cardiac hypertrophy, a palpable liver edge, sacral edema, orthopnea, cyanosis and blood pressure of 86 systolic and 54 diastolic. The white count was 9,600, the temperature 102. She also had a stone in her left kidney pelvis and pyuria. She was discharged five weeks later in a good state of compensation and, as far as we know, is in fair health three and a half months later. She illustrates a painless type of infarction in whom the diagnosis could only be guessed without electrocardiographic confirmation demonstrating Pardee's phenomenon (Fig. 8).

Case 4.—John M., a male aged 59, suffered from very severe precordial pain for five days with fever, rapid pulse and collapse. A precordial friction rub developed. The electrocardiogram was taken one year after infarction and still showed Pardee's phenomenon in the second and third leads (Fig. 9). He is in good health two years and five months later.

Case 5.—Dr. D., a male aged 62, dated his limitation of activities, due to precordial distress, to a single severe protracted attack of angina pectoris two years before this tracing was taken. Lead I shows Pardee's phenomenon (Fig. 10). His survival so far has been two years nine months.

Case 6.—F. M., a male aged 67, had his first attack of

angina pectoris four and one-half years ago. In February and July of 1924 his electrocardiogram showed a negative TI at another clinic. In January and July, 1925, his tracings were reported practically normal. After freedom from symptoms for three years a Pardee's sign was present in his electrocardiogram four days after a severe second attack (Fig. 11). Two and a half months later there was only a negative TI and Pardee's sign has disappeared (Fig. 12). He is alive and working, free from further attacks four and one-half years after his first infarction and one and three-fourths years after his second attack.

Case 7.—W. M., a male aged 54, suffered a very severe attack of precordial pain accompanied by an irregular pulse, temperature of 99.8, and had a white cell count of 14,150. He had had an old luetic infection which had been treated and now has a negative Wassermann. Two days after his infarction he had a flat TI and numerous extrasystoles (Fig. 13). Three months later the TI was again positive but Pardee's

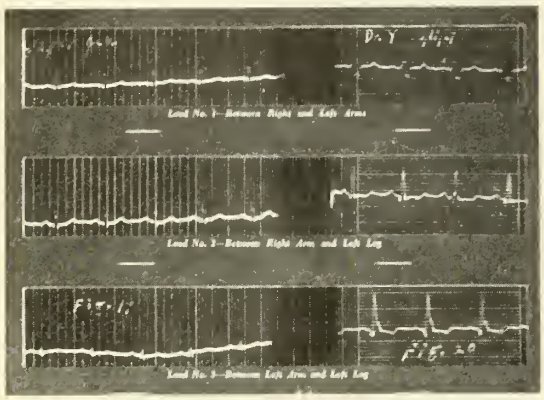


Fig. 18

Fig. 19

phenomenon was present in Leads II and III (Fig. 14). He is an active insurance agent one and one-half years later.

Case 8.—J. W. G., a male aged 68, had had repeated typical attacks of angina pectoris for the past eight years before his first electrocardiogram was taken, which showed a right bundle block (Fig. 15). Six months later, during which interval he was free from attacks, a second tracing showed the bundle branch block had disappeared (Fig. 16). A third tracing four and one-half months later, about two months after a severe attack of angina, then showed the bundle branch block had reappeared and, in addition, an auricular fibrillation (Fig. 17). This patient also had gallstones and a diverticulum of the esophagus. He is still living a fairly active life one year after his last infarction, free of angina with good compensation under digitalis.

Case 9.—Joe M., aged 64, had an infarction two and one-half years ago, accompanied by severe precordial pain, vomiting and hemoptysis. The attack was followed by left basal pulmonary infarction, and, later, signs of embolism in the left posterior tibial artery and fresh pulmonary infarctions. The diagnosis was infarction of interventricular septum due to occlusion of the descending branch of the left coronary artery with mural thrombus on both sides of the septum, casting off emboli to both the pulmonary and systemic circulations. The tracing was taken one month after infarction and showed no abnormality of the T-waves, and only a slurring and notching of the QRS complexes in Leads II and III with low voltage (Fig. 18). This man's activities are limited by dyspnea and precordial pain, two and one-half years after infarction.

Case 10.—Dr. Y., male, aged 66. Five years before this patient's tracing was taken he had an attack of angina pectoris diagnosed coronary infarction. He led a very active country practitioner's life ever since without any distress. At the date of this curve, he was suffering from thrombo-angiitis obliterans. There were also signs of arteriosclerotic kidneys, marked peripheral arteriosclerosis, and two months after this tracing he died of cerebral hemorrhage. This case illustrates the effects of universal vascular disease. The electrocardiogram shows a left bundle branch block (Fig. 19). He survived his coronary occlusion five years and two months to die other than a cardiac death.

CONCLUSIONS

1. Ten cases of coronary occlusion are reported with survival—the longest duration being five years two months. Two of these cases survived at least two occlusions besides having attacks of angina pectoris.

2. The electrocardiogram offers substantial corroborative evidence of coronary occlusion, and, of the changes found, Pardee's sign is the most suggestive (seven out of ten cases).

3. Pardee's sign was found to appear as early as the second day and to still be present, in some cases, as long as two years after occlusion took place.

4. Many cases survive minor occlusions, and rare cases extensive infarcts.

5. Death may occur in these cases months later from congestive myocardial failure with or without further attacks of precordial pain.

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DISCUSSION

Dr. C. N. Hensel (St. Paul): The problem of coronary infarction and its relation to the subsequent viability of the patient has been beautifully presented to you today. It is an interesting fact that these cases of proved infarction can survive such an insult to the heart provided the condition is recognized at the onset and the treatment guided by both clinical and electrocardiographic findings. This characteristic cresentic shaped deflection of the T-wave is the best diagnostic criterium and the cases that recover may show a return to the normal contour.

This problem of coronary infarction is not only of interest to the internist but also to the surgeon. Frequently in cases of coronary infarction, the pain originates in the abdomen, only secondarily rising to the lower sternum, and may cause symptoms simulating acute abdominal disease such as gallstone colic. Cardiograms in these cases may show the characteristic changes in the T-wave and thus forewarn of grave cardiac condition and perhaps cause postponement of surgical intervention.

I recall one such case of a woman of seventy years of age who had had repeated attacks of gallstone colic for many years. The present attack was of undue severity and attended with more than the usual prostration. She was taken to the hospital and watched for twelve hours under the exclusive care of a very competent surgeon. There was tenderness over the gallbladder region, muscular rigidity and pain over the lower part of the sternum. Slight fever and leukocytosis were found. At operation a gallbladder full of stones was found but because of her poor general condition and of a rapid pulse the operation was quickly terminated, the gallbladder being left in place and drainage instituted. When seen at six o'clock that evening by her attending physician her condition seemed to be satisfactory. At twelve she awakened from a drowsy sleep gave a few gasps and was dead. At autopsy the pericardial cavity was found filled with blood. When the heart was removed one could detect an area of softening in the wall of the left ventricle in which there was a small tear entirely through the wall. It was from this torn area that the hemorrhage took place, which caused her death. The microscope revealed that this area of softening was due to a previous coronary infarction and undoubtedly this infarction was responsible for her pain simulating her gallbladder attacks. It seemed probable that the strain of the operation and the subsequent nausea had been sufficient to rupture the heart. Had an electrocardiogram been made previous to operation it might have warned the surgeon of the serious damage to the heart and the fatal issue might have thus been avoided.

Since we have been using the electrocardiograph more routinely we have come to recognize that there are patients who have the angina pectoris syndrome without coronary infarction, but who eventually develop infarction of tiny branches of the coronary arteries, accounting for the more prolonged attacks of anginal pain. In these cases usually the final major attack of pain will cause the death of the patient and at autopsy multiple areas of fibrosis in the heart muscle are found, indicating previous infarctions. So the electrocardiogram is frequently of value in differentiating simple angina pectoris from mild coronary infarction.

I have a case to report with a few lantern slides which illustrates Pardee's phenomenon in the T-wave that Dr. Evans has shown through his series. The patient, a Jewess, fifty-six years of age, a diabetic for five years, was seized suddenly after a hearty evening meal with intense pain in the middle of the sternum. My associate was called and found a bounding pulse and strong heart tones. Blood pressure was 220 systolic and 110 diastolic. Surrounded by anxious relatives and greatly excited herself, it was difficult to be sure that the patient was really ill. Nitrites and morphine brought some drop in blood pressure and some relief of the acute pain, but a dull sternal pain persisted for several days. An electrocardiogram the following day showed a slight coronary T-wave in Lead 1 with a deeper drop on the second day, subsequent records showing a gradually rising T-wave till at the end of three weeks the T-wave had lost its coronary curve and was only slightly flattened in Lead I.

The patient has now lived a year and a half following this attack of coronary infarction. Of course we know that diabetic patients have as a rule a generalized arteriosclerosis and are susceptible to coronary infarction. This case illustrates nicely what happens with recovery. I have had experiences with other cases illustrating the same points Dr. Evans has shown. Some of them make clinical recoveries, others do not die, but they drag around with a persistence of marked debility and greatly limited heart capacity. The cases that recover their former energy show eventually a return of the T-wave to the upright position. The cases that do not recover their customary energy usually show on their cardiographic records a persistence of the downward declination of the T-wave or a marked flattening of the T-wave, indicating grave myocardial damage.

The cardiograph is becoming of increased value as an aid to differential diagnosis, and as a guide to treatment.

Dr. George Eusterman (Rochester): I want to bring out two points. The other day I had a patient

who had been with us seven years previously and we had made a diagnosis of generalized arteriosclerosis. He came back presenting gastro-intestinal disturbance, largely gastric. No evidence of disease of the gastro-intestinal tract or biliary tract was found. There was a little history of dyspnea. The heart was of normal size and normal rhythm. There was evidence of some torsion of arch of the aorta on the film. Generalized arteriosclerosis was present as before. The blood pressure was normal. The patient was reassured that there was no organic gastric disease. Two weeks later the brother wrote that after a hearty dinner the patient went out and played golf, and died suddenly on the course.

Willius says that practically 50 per cent of those with infarction of the coronery arteries die in the first attack.

One other point is the sensitivity of the patient with angina pectoris and coronary infarction. Libman brought this out at the meeting of the Association of American Physicians. Dr. Evans brought out the point of the degree of pain. Libman feels that patients vary in sensitivity to pain and that insensitive patients may have definite infarction without any pain; he demonstrated this point in three or four patients in the wards at Mt. Sinai, using pressure on the styloid process as the index. Crohn feels that patients whose first symptoms of gastric disease are hemorrhage or perforation or obstruction are insensitive persons who do not have the usual symptoms. The same is true of patients with cancer who go on to inoperability before symptoms occur. I want to congratulate both Dr. Evans on his presentation and Dr. Hensel on his discussion.

JAUNDICE PROBLEMS*

S. H. Boyer, M.D.
Duluth, Minnesota

JAUNDICE, the symptom, is forever flashing itself before us. Sometimes it is thought of as something likely to appear during the course of a disease under observation and then it does not surprise us when it comes, but more often it appears unexpectedly as a seemingly isolated sign. It always rouses curiosity and is always a puzzle. Wonder as to its cause, query as to its treatment rise up like a blank wall. There is a feeling akin to helplessness. I suppose almost every doctor has had that experience.

Of course the various etiological factors pass before one's mental vision, but, even so, diagnosis is not always so easy. Besides, there are cases that do not permit of a thorough clinico-scientific study. The patient may refuse special methods of examination, may be unfit to bear such methods, may be remote from a place where such technical work is available and may refuse to be moved; also, the patient's history may be difficult or impossible to secure. All these and perhaps other factors make it necessary for the doctor to know the clinical picture of the various conditions presenting the common symptom of jaundice and to be able to thread his way through the diagnostic labyrinth with a minimum of special technical methods. An aged person presents jaundice as a salient symptom and the most careful analysis of recognizable concomitant symptoms may fail to enable us to say whether there be duct obstruction due to pressure from outside, changes within the walls of the duct, obstruction from within the lumen or changes in the liver substance or perhaps a jaundice of hemic origin. If surgery or autopsy be not done etiological diagnosis may never be made.

A few actual cases will be discussed, as that is the best way to draw parallels and contrasts.

Case 1.—A woman thirty-eight years of age and the mother of several children said she had been quite well up to two months prior to admission to the hospital. She then began to feel tired and indisposed, lost her appetite, felt nauseated much of the time and occasionally vomited. She presents a Grade 1 icterus and admits upon close questioning that she first noticed this some three months ago, characterized by periodicity, a gnawing pain in the stomach at a variable time after meals and relieved by food. She has never had an acute attack of pain. Continuing to question searchingly it is learned that she has had much indigestion over a period of many years and also alternating constipation and diarrhea. She states that her indigestion is better than it was, that it has varied in degree and that her stools have been and are a pale yellow. Her physician says the urine contains bile.

What is the etiological factor in this case? So-called acute catarrhal jaundice must be thought of but the variability of her icterus, its long duration, absence of fever together with her gastro-intestinal symptoms are certainly suggestive of chronic cholecystitis and secondary irritation of the colon. Perhaps a stone shifting its position between the cystic and common ducts would account for the variable jaundice. The patient was too ill to be subjected to a complete gastro-intestinal and Cole-Graham examination at the time. However, the Van den Bergh tests and blood count were done. The results both complicated and clarified the diagnosis. They were as follows:

Icterus index, 20.

Van den Bergh (direct) negative.

Van den Bergh (indirect) immediate and positive.

Blood picture: that of pernicious anemia.

Treated with liver extract her improvement was prompt and rapid.

The blood picture and indirect Van den Bergh would indicate icterus of hemolytic origin and made a different interpretation of the gastro-intestinal symptoms possible. But, why the pale stools? Certainly we do not expect such in pernicious anemia. May not cholecystitis also be present? At a later date when the patient's condition permitted, the Cole-Graham examination was made. Dr. T. G. Clement, roentgenologist, submitted the following report:

"G. B. not filled in 12 and 15 hours but well filled in 24 hours.

"Small dense shadow cystic duct suggesting stone. Delay in filling and emptying time of gallbladder suggests and confirms cystic duct ob-

*Presented at the annual meeting of the Northern Minnesota Medical Association, Bemidji, Minn., Sept. 2, 1929.

struction." Here then is a case for multiple diagnosis—clinically the gallbladder symptoms masked those of pernicious anemia. The latter was not accompanied by nerve symptoms in this case. The positive Van den Bergh indirect test pointed away from duct obstruction and when supplemented by the blood examination the source of the jaundice became clear. It was of hemolytic origin. The long years of gastro-intestinal symptoms surely antedated the onset of the pernicious anemia. They were characteristic of gallbladder disease. The *x*-ray examination tends to confirm that diagnosis.

Case 2.—A white female, aged 25, married, was taken ill with headache, weakness, vertigo, nausea and vomiting. Then came labor pains, convulsions and coma. Labor was precipitate. She was then taken to the hospital, two days after the beginning of her symptoms. She was still unconscious and icterus was noticed for the first time. It was about Grade III. The record shows her to be poorly developed and poorly nourished, to have a badly neglected mouth, a normal blood pressure, impalpable spleen and liver, no edema. Other physical findings were essentially normal. The vomitus had been clear and watery at first but was coffee ground type when admitted to hospital March 15. It continued so for the next two days, by which time she had regained consciousness, felt languid and nauseated, but otherwise quite comfortable. Shortly the icterus was complicated with fever.

It may be assumed that a toxemia of pregnancy had existed and was subsiding, but what about the jaundice? Again the puzzle. Was it acute catarrhal jaundice or acute yellow atrophy? The languor, continued mental dullness and fever were not distinctive. They could be attributed to the recent eclamptic state. The fever could be attributed to a poorly contracted and poorly involuting uterus. It could be associated with an acute cholangitis. It could be accounted for by an acute hepatic degeneration. The latter is common enough in pregnancy to not excite surprise when it occurs. Admittedly it was too early to arrive at a definite diagnosis. Laboratory methods might help, but in their absence, and conceivably with them, time alone could solve the problem.

On the first, second and third days after admission her icterus index was 85, 89, and 187 per cent. On March 21, 8 days after admission, the Van den Bergh direct was four plus and the indirect was the same. The test for urobilin in the urine was negative. The ammonia nitrogen urinary output on March 19, 20, and 21 was 2.2 gm., 1.3 gm. and 0.5 gm., respectively. The blood examination on March 16 (next day after admission) was 78 per cent hemoglobin, 4,620,000 erythrocytes and 22,200 white cells. The next day the white cell count was 27,400.

Now, how may we interpret the laboratory reports to aid us in reaching a rational conclusion? It is true that acute yellow atrophy may be accompanied by headache, coma, and convulsions, but these do not precede the icterus, they follow it, and appear late in the affection. Thus we may be sure that in this case they were probably due to a pregnancy toxemia and that whatever may have happened to the liver in the way of acute degeneration, even though due to the same primary etiology, was of later development.

The laboratory findings of a high and rising white cell count point clearly enough to infection, sufficient perhaps to start degenerative hepatic changes. But a high leukocytosis is not in itself distinctive of acute yellow atrophy. The rising icterus index is common to all forms of obstructive jaundice and taken alone is not etiologically distinctive. The Van den Bergh tests, direct and indirect, are high. Again we find nothing definitely diagnostic. We may infer from them that all the bile secreted by the liver does not reach the intestine and that some change is probably going on in the liver cells, the nature of which we do not know. It might also be inferred that some of the jaundice might be due to blood destruction. However, the near normal erythrocyte count, 4,620,000, does not justify such a conclusion. The negative urinary urobilin findings also point away from hemolytic jaundice. If bile reaches the intestine it is in part converted into urobilinogen and urobilin. As such it is reabsorbed, taken to the liver and converted into bilirubin. If the liver is so badly degenerated that it cannot change urobilin into bilirubin it is probably also incapable of secreting bile; therefore urobilin would not be expected to appear in the urine in acute yellow atrophy. As the net result is the same in complete obstructive jaundice the failure to find urobilinuria does not help us much. The record fails to show the color of the feces. If an observation had been recorded indicating the presence or absence of bile in the stool, then this, taken together with icterus, would afford something tangible in the direction of an etiological diagnosis. We are denied this small help.

One function of the liver is deamidization. The laboratory record shows a marked increase in the ammonia nitrogen excreted in the urine. This is suggestive of failing liver function. As this patient had suffered a pregnancy toxemia we cannot be sure that an acidosis was not responsible for the high ammonia nitrogen excretion in the urine. The latter view is strengthened by the following rapid reduction in the ammonia

nitrogen output. Thus but little positive diagnostic aid is derived from the laboratory findings, which, by the way, are sometimes apt to be very confusing to one doing clinical work. As this patient began to improve very shortly, and was discharged from the hospital as cured at the end of two weeks, it is quite likely that the final diagnosis of acute catarrhal jaundice was correct. On the other hand we are not to assume that there was no degree of acute hepatic degeneration. The toxemias of pregnancy are known to be peculiarly causative of the syndrome mentioned. It may very well be that such a process actually started in this case but owing to the weakness of the toxemia, or its short duration, or to a high power of resistance by the patient, or all three influences together, resulted in recovery with but little damage. How little or how much damage may never be known. Perhaps the reparative scarring may be sufficient to cause symptoms of hepatic cirrhosis at some future time. Perhaps some day this patient may come to autopsy, when the pathologist will read the story of an old arrested acute yellow atrophy.

Case 3.—A male, aged 21, a laborer, sailor and world wanderer, was admitted to the hospital August 31 and died two days later. The record shows that his illness started about two weeks before entering the hospital. He felt weak, had headache and slight jaundice. A doctor sent him to bed for a week. He then worked two days and quit. There was progressive weakness and icterus, prostration, confusion, delirium and stupor —then death.

The past history and physical findings in this case are meager indeed. He was well nourished, had dental caries, icterus, and his liver and spleen were not palpable. These were the only notations of interest.

The laboratory report shows a normal blood count except for a slight leukocytosis of 10,000, an icterus index of 166, Van den Bergh negative direct and positive indirect. The diagnosis recorded is acute yellow atrophy.

Certainly this case record affords very little for purposes of scientific study. The course of the illness, however, contrasts markedly with that of the preceding case and confirms the statement that delirium, convulsions and stupor are late symptoms in acute yellow atrophy. Note that in this case the onset was gradual, the course progressive and the end fatal. Note that in the preceding case the onset was sudden, the icterus followed the convulsions, the progress was toward rapid recovery.

Now why should this apparently healthy young man develop this fatal malady following a seemingly normal condition? Certainly acute hepatic degeneration does not arise without cause. Certainly, also, dental caries as noted in the record could hardly be accepted as the probable cause. That this disease is due to an intoxication or infection of some sort there can be little doubt. Failing to find it in the clinical record we turn to the autopsy hoping for something informative. The autopsy report is submitted in brief:

Teeth are carious.

Liver weighed 1,000 gm.; is mottled with yellowish patches and softer than normal. Cut surface shows soft yellow patches alternating with purplish red patches. Bile ducts are patent. Acute cholecystitis present.

Small hemorrhages present in mesentery and kidneys.

Post-mortem diagnosis: Probably acute yellow atrophy, acute cholecystitis, dental caries, pulmonary edema, small hemorrhages into mesentary, omentum and kidneys.

On the basis of this report we can assume the mouth hygiene to have been extremely bad and accompanied with dental and gum infection. We could think of this as a possible etiological factor but acute cholecystitis should be considered in that role a great deal more logically. It could be considered more seriously if an associated cholangitis had been reported. The absence of any definite source of toxemia leaves us in the realm of speculation. One can't help but wonder if this homeless wanderer may not have been luetic, and, if so, had he been treated with antiarsenicals and been an individual sensitive to arsenic?

THE DIAGNOSIS AND TREATMENT OF ABNORMAL UTERINE BLEEDING*

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THIS discussion is limited to the significance of various types of pathological uterine hemorrhage and excludes that associated with late pregnancy and labor.

To appreciate the abnormal we must accept a working hypothesis of normal menstruation and pregnancy. Much research still leaves many points at issue. For practical purposes, however, we are justified in certain dogmatic assumptions based on the work of Frank and his collaborators.

1. We assume the formation of a single, specific "sex hormone" secreted in the ovary; certainly in the Graafian follicle and corpus luteum; and probably also in atretic follicles, stroma, and the so-called interstitial cells. After implantation of the fertilized ovum, this hormone is stored or formed in the decidua and placenta.

2. The relatively small amount of hormone furnished by the immature ovary, in conjunction with internal secretions of the pituitary, thyroid, adrenal, and other glands, is sufficient to determine prepubertal development of the special and secondary sexual characteristics.

3. Periodic maturation of the ovum, including development of the Graafian follicle, its rupture, and formation of the corpus luteum, all of which begin at puberty, causes recurring waves of increase in the amount of sex hormone in the body, followed by sharp decline. These cyclical variations induce equally constant changes in the uterus and endometrium, sufficient to provide a suitable field for implantation of a fertilized ovum, should it be present. In that case the corpus luteum persists for a time. From this source and from the decidua and placenta, an adequate amount of hormone is provided to maintain a status quo in ovaries and uterus to nourish and to protect the growing product of conception. It prevents uterine bleeding and probably inhibits ovulation.

In the absence of implantation, there is a sharp decline in the amount of sex hormone, associated with atrophy of the corpus luteum and bleeding from the congested endometrium. Therefore, physiological uterine bleeding, menstruation, occurs only from an endometrium altered by an increase of sex hormone associated with ovulation, and is due to a sudden decrease of this secretion in the absence of successful implantation of a fertilized ovum. A number of factors modify the duration and amount of hemorrhage. Variations in periodicity are always pathological.

Menorrhagia, excessive or prolonged menstrual bleeding, is a relatively abnormal reaction to normal stimuli. It is pathological when the blood lost is not restored during the intermenstrual period. Anemia is frequently present and indicates the severity of the condition. Following puberty some variation is common. Usually it is temporary and self limited, being of slight significance. In other instances constitutional treatment is followed by readjustment. An occasional case, however, will present serious effects and prove most baffling.

Endocrin imbalance, blood dyscrasia, and, rarely, local lesions are to be considered in the etiology. Endocrin factors include ovary, thyroid, pituitary, adrenal, possibly other glands. The disturbance is often temporary. Gland therapy is still empirical or worse, assurance of detail men to the contrary notwithstanding. Blood dyscrasia, hemophilia, and thrombocytopenic purpura are surprisingly frequent in young women. Low blood platelet counts, under 60,000, are suggestive. Chlorosis, with its characteristic blood picture, is not uncommon. These conditions are the cause of many obstinate cases of menorrhagia. Therapy with calcium, iron, or blood transfusion is most effective. Tuberculosis and lues are occasional causes of this type of bleeding.

X-ray treatment of the splenic region through its action on blood formation has some value. Effort to modify ovarian secretion by this agent, unless used with great skill together with a large measure of good luck, is likely to do more harm than good. At this period of life some type of constitutional treatment is the method of first choice. Local pathology is less common and less important than later in menstrual life. Pelvic

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examination under anesthesia is usually negative. Uterine curettage is rarely of therapeutic value. Resection of ovarian cysts or a cystic ovary may occasionally give more than temporary improvement. Hysterectomy or castration in the young is a frank confession of failure. However, one may be forced to consider it in uncontrollable cases.

The importance and frequency of local causes increase with years, with infections, and with childbearing. Tumors, local inflammation, subinvolution and prolapse—all predispose to menorrhagia. Thorough examination will reveal the cause. Properly selected surgical treatment will control the bleeding, and retain ovarian secretion. Hence it is truly conservative. In some cases of prolapse and subinvolution subtotal hysterectomy offers the most effective solution. Radiotherapy in a carefully restricted group of cases may be considered. Contraindications are: Inflammation or sepsis, ovarian tumor, large uterine tumor, submucous fibroid or polyp, cachexia or severe anemia. Malignancy must be excluded. Pregnancy must be interdicted for at least a year following treatment.

Metrorrhagia or irreguar uterine bleeding of whatever degree is an objective sign of serious import. It is independent of ovulation. It is always abnormal. The amount may vary from blood-tinged discharge to profuse and dangerous flooding. It may follow local trauma, examination, douche, or intercourse. It may be intermittent, or nearly continuous. In any case one must exhaust every means to find the cause and carry out proper treatment without delay.

We shall consider two groups.

1. Bleeding due to a pathological condition in early pregnancy.
2. Bleeding due to other local lesions.

Any bleeding during pregnancy is pathological. It may occur before there is reason to consider pregnancy. If accompanied by unilateral pain, one must suspect an ectopic implantation. So-called menstruation during gestation is due to atypical hypertrophy of the decidua which bleeds easily in response to variations of the sex hormone. This bleeding is periodic in type, slight in amount, unaccompanied by pain. It is quite different from that associated with placental separation or threatened abortion. Thyroid extract is of definite value.

Impending or actual abortion with disturbance in placental attachment is the most frequent cause of uterine bleeding during early pregnancy. In such cases one must consider several questions:

1. Is the abortion only threatened or is it inevitable? If the blood lost exceeds that of normal menstruation, or if there are severe uterine contractions, the fetus is probably dead and will be expelled. Rest and narcotics may prevent threatened cases, but do not delay an inevitable abortion.

2. Is the interruption of pregnancy spontaneous, or has it been artificially induced? In the latter case we recognize an increased liability to infection and to retention of secundines.

3. Is the abortion complete? Examination of the material expelled may give the answer. Bleeding continues till the uterus is empty. Unless this has been accomplished spontaneously within a few days or a week, mechanical assistance is necessary. Oxytoxics are uncertain but may be tried. Vaginal manipulation or packing is but little safer than proper exploration under anesthesia. It is also of slight value. Hemorrhage is the only indication for interference. It is rarely sufficiently alarming to justify emergency operation. One must allow time to exclude infection. History of previous vaginal manipulation requires extra caution. Repeated intrauterine operations should be unnecessary; they are dangerous as well as useless. An adequate procedure will control bleeding in all simple cases, or suggest the presence of other conditions. Fever means infection and contraindicates any local manipulation. Study of the curettings may disclose hydatid mole or malignancy. Negative uterine findings together with careful bimanual examination will sometimes disclose an ectopic pregnancy which is in process of abortion. The clinical picture is often confusing. Uterine bleeding begins with disturbance in placental attachment and continues till ovulation is re-established.

Aside from pregnancy, metrorrhagia is always due to local lesion with destruction of the endometrium. Its causes include:

1. Preclimacteric hypertrophy of the endometrium, in rare instances. Diagnostic curettage fails to disclose cancer. This operation, together with suitable pelvic repairs, is followed by cure. In case of recurrence the presence of cancer must be assumed and radical treatment instituted.

2. Submucous or pedunculated fibroid tumors are associated with hyperemia and destruction of the endometrium resulting in metrorrhagia. Di-

agnostic curettage and biopsy is necessary to exclude cancer which may accompany gross tumors. In its absence excision of the growth or hysterectomy is the proper procedure. Radium is not advisable.

3. Cancer involving the mucosa promptly causes intermittent bleeding. This is the earliest and most constant sign of the disease. This type of abnormal bleeding, including postclimacteric hemorrhage of any sort is an absolute indication for immediate diagnosis and treatment. Biopsy and study of curettings permit the diagnosis of cancer. If properly done it is without danger, provided therapy is instituted at once. Study of cell structure will influence prognosis and type of treatment. For cancer of the body or fundus, total hysterectomy offers a good prognosis, and is the procedure of choice. For cancer of the cervix or vaginal portion, radium, properly applied, has largely supplanted surgery, even in early operable cases. Systematic follow-up with efficient doses of deep *x*-ray is advised.

To summarize: Variation in amount or periodicity of uterine bleeding is a frequent symptom and sign. Abnormal duration or amount indicates a study of constitutional factors, after which local causes should be sought. There is comparatively slight danger from reasonable delay for investigation. Variation in the usual periodicity, however, points to local pathology. Diagnosis is urgent and is always possible. This must precede treatment. Curettings must be studied grossly and microscopically. There is no excuse for repeating a therapeutic curettage. We must emphasize to ourselves and to our patients the fact that metrorrhagia or post-climacteric bleeding is always pathological. It is only by full appreciation of this fact that we can reduce the mortality of cancer of the uterus.

Again, abnormal uterine bleeding is an important objective evidence of disease, unequivocal in character, and simple in interpretation. Let us give it the attention which it deserves.

HYPERTHYROIDISM IN CHILDREN*

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UNTIL a few years ago hyperthyroidism in children was thought to be extremely rare. Although the condition is being met with more frequently, we can still follow Helmholtz' dictum that it is extremely rare in early childhood, and becomes more common with the approach of puberty. It seems to be, however, more or less limited to the female, for I am able to find only one case in the literature of hyperthyroidism in a male child under ten years of age.

In agreement with previous articles on this subject we have chosen fourteen as the upper age limit. Although this series of eight cases is rather small, still the lessons learned in handling them have been very interesting and instructive.

REVIEW OF LITERATURE

Lewis in 1914 reported five cases of exophthalmic goiter in children among 1,512 goiter patients operated on at the Mayo Clinic between 1905 and 1913. Sattler has reported the largest series, having studied 184 cases in children among a total of 3,477. Dinsmore in 1926 reported forty-eight cases of hyperthyroidism in children observed at the Cleveland Clinic, eight being in boys and forty in girls.

Numerous single cases have been reported by various men, while White has reported a case of exophthalmic goiter in a newborn infant where the mother was suffering from the disease, and Klaus in 1914 reported a case in a nine month old infant.

ETIOLOGY

The cause of this disease is more or less uncertain. However, by reviewing the case records of the various individuals coming under my observation, I have come to some definite conclusions as to the factors which to me have been practically specific in causing a hyperactivity of this gland.

Infections.—Three of the patients in our series definitely attributed the onset of the present illness to some acute infectious disease, two of them having had influenza and one scarlet fever within two years of the time they came under observation. Many other infectious diseases such as tonsillitis, sinusitis, and pneumonia, have been reported as factors in the production of hyperthyroidism.

Shock, Injury or Emotional Disturbance.—A great deal has been written and there have been many discussions regarding the influence of bodily injury or mental shock on the activity of the thyroid gland. This discussion has been confined mostly to adult cases, and from a medico-legal point of view a great many theories have been advanced; however, very little has been said regarding this factor as a causative agent in children.

Hill reports a case, that of a seven year old girl, who, on account of some harrowing experience encountered during the war, developed a typical exophthalmic goiter.

In our series of cases, there were two which we can definitely place in this category. One patient had been slightly injured and badly frightened while on a sleigh ride. The other, a girl, had been perfectly well until the afternoon her grandmother was buried, when she suddenly became rather hysterical and began vomiting, which was followed by the typical hyperthyroid syndrome.

Use of Prophylactic Medication.—This is another phase which brings forth a great deal of discussion. So much has been written in the newspapers and lay magazines regarding the prevention of goiter that a large number of so-called preventatives have been placed on the market and given to children with absolutely no thought of putting the child under the care of a physician while the medication is being used. It is rather left to the grocer, druggist, nursemaid or mother to determine the dosage. While I believe the prophylactic use of iodine or one of its derivatives is a perfectly correct procedure when given under medical supervision, nevertheless we have seen cases of hyperactivity of the thyroid gland develop in such instances. Marine and Kimball in their series of 4,415 children who received iodine as a prophylactic had from 0.5 to 1 per

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cent of their cases develop symptoms of hyperthyroidism which promptly disappeared when the medication was stopped.

DeQuervain had a similar experience, but thinks that the risk is nil if the prophylactic dose does not exceed three milligrams.

Bram in a series of 3,343 cases saw 3 per cent develop hyperthyroidism while an additional 1 per cent had trouble from the use of thyroid extract.

By far the most dangerous prophylactic used today in my opinion is iodized salt. Three of the patients in our series gave a definite history of having used this type of salt from two to three years, and without doubt this changed an inactive goiter to a very active type.

Adolescence.—Because of the rather sudden rise in the number of cases of exophthalmic goiter about the time of puberty, the theory has been advanced that the change in the life cycle may be a factor in causing an increased thyroid activity. The great majority of cases of hyperthyroidism, as we know, occur during the period of sex life, and it is a very reasonable theory that the ovarian activity has an inter-relationship with the activity of the thyroid, and vice versa.

PATHOLOGY

The glands in this series of cases (and all were partially or totally removed save one in which a unilateral superior lobe ligation was done) showed the gland to be bilaterally enlarged, rather firm in consistency, with some areas throughout the gland which were soft and friable, evidently areas of degeneration. Such an area may often on palpation be confused with a small adenoma, which would follow Kitchen's observation on examining large groups of children having enlarged thyroids. None of these patients had true adenomas, and I am unable to find any case in the literature of hyperthyroidism with adenomas in children. In fact Plummer states that it is an exceedingly rare observation in persons under the age of twenty-five years.

The microscopic picture was somewhat varied in that certain portions of the glands showed a true hyperthyroid state with cells of the columnar type, some of which were undergoing mitosis, with the acini small, and filled with a rather small amount of thin material. On the other hand portions of the gland gave the appearance of being inactive with the cells flattened, the acini distended with colloid and a marked decrease in the vascularity. Whether or not this is the picture that persists during the disease or whether this colloid portion of the gland is due to the administration of iodine in the pre-operative treatment, is a matter of speculation, but I believe it is highly plausible that iodine medication bears a part.

SYMPTOMS

In the past it has been the consensus of opinion that hyperthyroidism in children has a rather prolonged onset or course with the various symptoms coming on slowly, the duration of the symptoms varying from one to twelve years; in other words that acute hyperthyroidism in children is a rare observation.

This is undoubtedly true, nevertheless one of the patients in this series dated the onset of her illness to twenty days previous to her admission to the hospital, and at that time she was in a true crisis.

Carroll reports the case of a girl thirteen years of age, who was in an accident, at which time she experienced a severe fright. She developed a true exophthalmos with symptoms of exophthalmic goiter within twenty-four hours after the accident. The symptoms increased in severity and she made an uneventful recovery following a thyroidectomy, preceded, as was the usual case some years ago, by bipolar ligation. From these two cases we see that hyperthyroidism may have an acute onset.

The illness usually begins with marked nervousness and irritability, and following this the parents usually observe an hypertrophy of the gland.

Tachycardia was present in all the cases in this series, ranging from 120 to the most severe case, in which the pulse was persistently 175. The manifestation of tremor was not constant. Only one girl showed a true tremor. Weight loss was almost a constant observation, ranging from five to fifteen pounds.

Helmholtz believes that this type of case should be called true exophthalmic goiter. Nevertheless not all of these cases develop the typical ocular changes seen in this type of goiter. In fact this is a rare observation in some series reported, although Dinsmore found a large percentage of his cases with true exophthalmos.

In our series four patients showed marked

exophthalmos, one a slight degree, and three had no eye changes. All of these children showed a normal mentality; in fact the majority showed a tendency to be beyond their years mentally.

Just how accurate the basal metabolism readings are in these cases is questionable. Whether or not a way will be worked out to determine this reading more accurately remains to be seen. The rates in our series varied from plus 38 to plus 178, but I believe that these are all higher than they should be. The fact is the child with a rate of plus 35 or plus 40 may be considerably more hyperthyroid than a plus 75 or 80 when we compare the rest of the clinical picture.

TREATMENT

Treatment of these cases was that usually carried out in exophthalmic goiter, but there are two or three points that I wish to emphasize. First of all the preoperative preparation. As in the adult, Lugol's solution was our greatest single weapon of attack. However, there is a great difference in the time element necessary in the preparation of these cases. We know that the ordinary adult with exophthalmic goiter can be prepared for a thyroidectomy in from twelve to twenty days under Lugol's solution, but this is not the case in children. A great deal longer is required or the patient will not withstand any surgical procedure, no matter how slight. Two cases have been brought to my attention, the one having been prepared with Lugol's solution for twenty-one days and the other for sixteen days. In the first case a one sided lobectomy was done and in the second a ligation, but immediately after operation each patient developed a true crisis and died within twenty-four hours. From these cases I believe that instead of days for preoperative treatment, we must take weeks and often as high as three months.

As far as the operative technic is concerned, I believe it is difficult to be too radical in removal of the gland because of the tendency of the small remaining portion to rapidly hypertrophy.

Although outside the scope of this paper, I have seen two girls, fifteen and sixteen years of age respectively, who have had to undergo a second operation within a year's time for the removal of a rapid recurrence of an hypertrophic gland.

As in adults, I believe that Lugol's solution should be given post-operatively for a varying length of time, and that these patients, if possible, should be kept under observation for at least one year after operation.

SUMMARY

Because of the inconstant finding of ocular changes, I believe that this type of disease should be called hyperthyroidism rather than exophthalmic goiter, and that it is a much more common disease in young girls than previously thought. In the large majority of cases we find that some infectious disease is an important causative factor, and that shock, injury, fright, and promiscuous use of iodine as a prophylactic are very important etiological agencies. Symptoms are usually comparable to the adult type but the basal metabolism reading is not an accurate gauge of their true condition. A much longer pre-operative period is required than in the preparation of adults, and radical removal of the gland is the only possible cure.

THE INDUSTRIAL EYE*

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THE rapidly increasing use of automobiles and aeroplanes together with the widespread improvements in roads, bringing high powered machinery into the outermost parts of the country, has brought the question of the Industrial Eye to every physician, no matter where located nor what line of work he may be pursuing. It is, therefore, our belief that it will be time well spent to go over, somewhat carefully, the present understanding of this most interesting subject.

In the first place there is one consideration in every eye case which is often forgotten or overlooked. That is, the vision of the injured eye at the time the patient presents himself. Often this is overlooked because of an apparent mild injury or an outlying foreign body, and later the patient returns with a report of loss of vision, when the record of a visual test at the time of accident would have saved great expense to some one for compensation or damages. It is also needless to say that money would be saved to employers, should all applicants for work be given a preliminary visual test and careful record made therefrom.

The next step is the history, if it can be obtained, of the accident or of the development of the complaint. This should be taken very carefully, as we have had foreign body cases to be charged to the Company while the man was working on his own car during working hours.

Having obtained this information, the eye should be given what we are pleased to call the external examination. Every trained eye man has spent many hours going over the external examination of eyes very methodically until at a glance he can estimate where the pathology begins and is in position to make a complete record up to this point. To illustrate: An external examination proceeds as follows:

1. The general appearance of the patient's face and the skin about the eyelids is examined for evidences of injury.

2. Lid margins are examined, openings of the various glands, then condition of the puncta followed by compression of the lacrimal sac showing presence or absence of chronic infection there.

3. The conjunctival sac is thoroughly inspected as to:

   a. That portion covering the under sides of the eyelids.
   b. That covering the globe.
   c. That in the fornix, above and below.

The cornea is next thoroughly inspected as to smoothness of its surface, clearness and evidence of previous injury as well as evidence of present injury.

The anterior chamber is inspected through the cornea and its depth noted as well as the character of the aqueous.

The iris is next noted as to its integrity as well as activity.

Finally the lens is inspected, as well as the inner contents of the eye and the fundus.

Following this the finger tension is taken before any atropine is instilled.

If there is a lack of visible injury of the eye the muscle excursions are tested.

After making this examination, the evidences of injury are now weighed and an estimate of the immediate seriousness is completed before removing a foreign body or repairing an injury. Based upon these estimations a prognosis is then made as to the possible duration of disability and as to the probable outcome.

Having accomplished this, the eye is then anesthetised, foreign body, if one is present, is removed, or removal is attempted. The eye is then given a second examination following this to recheck the amount of damage done. Under all ordinary conditions this is followed by placing the eye at rest and as a rule covering it for a period of from twenty-four to seventy-two hours, as judgment indicates.

With the patient ready to be discharged we then, again, estimate the present amount of vision, comparing it with the vision taken: (1)

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at the time of injury; (2) at the time of employment, if that has been done.

As you are well aware we have several tables estimating the loss of vision, none of which are ideal but all of which are reasonably accurate. It is our opinion that the table (see below) prepared by the Minnesota Academy of Ophthalmology and adopted by the Oliver Iron Mining Company and State Industrial Commission is of the best at the present time, although Dr. F. Park Lewis of Buffalo and other men with vast experience in this kind of work are now attemtping to provide a new table.

TABLE OF VISUAL LOSS ADOPTED IN MINNESOTA
(Minnesota Academy of Ophthalmology)

READING	PERCENTAGE OF LOSS
20/20	Normal
20/25	5
20/30	10
20/40	20
20/50	25
20/60	33
20/70	40
20/100	75
20/120	85
20/80	50
20/200	100

Before proceeding to cite cases may I say that it is our belief that all cases of industrial eyes not showing improvement from any condition in a period of twenty-four hours following first examination should be referred to a trained oculist.

What then should be the picture in first aid in an Industrial Eye?

1. A visual test if possible.

2. An external examination looking for foreign particles in the skin of the lids, conjunctival sac, cornea, etc.

3. Cleansing of conjunctival sac of foreign material, using no rough or irritating methods, nor strong antiseptics. We prefer and recommend the use of normal saline, warm, or occasionally 1-5000 cyanid of mercury used after the instillation of a local anesthetic.

4. Removal of superficially attached foreign bodies from the cornea or conjunctiva. Any foreign body involving the stroma should be removed with great care, as injury to the stroma always results in scarring of the cornea with some loss of vision.

5. Instillation of one drop of one per cent atropine in the eye except where the tension of the eye is up or where past history is suspicious of a glaucomatous increase in tension.

6. Referring of any severe or even suspicious case to a trained eye man at the earliest rather than a late date following injury. Insurance companies never dislike to pay early bills but they frequently do question late bills.

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PSYCHOANALYSIS IN REACTIVE EPILEPSY*

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SINCE you are all familiar with epilepsy, you know that if we disregard the classifications which are based on the description of the epileptic attacks, all cases fall into two broad groupings: those cases in which epilepsy is symptomatic of cranial disease, and those in which no adequate brain pathology can be found and held accountable for its production. Of the latter type, which is the idiopathic or genuine epilepsy, there are certain cases in which there is present a marked disturbance of the emotions, sensibilities or feelings. There are many ways in which the emotions of this particular group of epileptics differ from those in so-called normal individuals, but the most common ones are: (1) the existence of an irritable tenseness in the interval between the attacks, which, though it may not be constantly displayed, is always very close to the surface; and (2) the likelihood that any violent emotion in the nature of anger, fright, fear or hate, may precipitate the convulsive or petit mal seizure.

The convulsive reaction of these patients to such emotional stress led Bonhoeffer to coin the term "reactive epilepsy," or to use a broader term which suggests greater involvement of the feelings or affects, Bratz uses affective epilepsy. No matter what term is used, it is merely one of description and of little consequence. The important thing is that in certain epileptics there is an abnormal emotional condition which must have its origin in the mind.

The forces which contribute to the faulty emotional state are partly within and partly beyond the scope of psychoanalysis. Within its compass are the complexes, repressions and ideals of the individual and beyond it are the personality or character of the individual and the ever present difficulty in epileptics of adjusting themselves to their family, social and economic obligations. Yet when you consider it, character and social adjustment are essentially mental reactions and are certainly influenced by our experiences. As an instance, let me say that egoism and hypersensitiveness are the dominant traits of character in the epileptic, but hypersensitiveness and egoism are interdependent because the egocentric person's interests are so narrow that they are constantly considering every contact and event in relation to themselves, and it follows that those contacts which are not advantageous to them are looked upon as slights.

This is how one patient explained the difficulty: "Even as a child I was always self-centered and self-conscious. Everything that happened seemed to travel in a circle which began and ended with my benefit in view. I struggled against the narrowness of this outlook because as I grew older I realized that my feelings were being hurt by everything that my family or friends did or said which did not definitely take my likes or dislikes into consideration."

While this view explains their sensitiveness, the egocentricity of their nature has deeper and more fundamental aspects. Some of the factors which contribute to it are, the prominence which the child assumes in the affection of its parents between the ages of one and three years; the example of egoism as a characteristic of one or both parents; certain methods of correction which make the child irritable and nervous; sexual desires and repressions in infancy, and too much praise for minor successes in early childhood. All of these factors, and many others, contribute to the child's egocentricity, and tend to bring about in the child hypersensitiveness and imaginativeness, because of the emotional involvement, and also to make it more or less tense and fearful, a typical foundation for a nervous disorder either early or later in life.

Let me report a case which developed epilepsy in her thirty-first year:

From her earliest recollection she was apprehensive, imaginative and nervous. Very early in childhood she had difficulty in sleeping; lying awake she was possessed with the fear that she would be stolen by gypsies and lost. From this fear she developed a horror of the color red, which made up the head dress and jacket of the gypsy of her imagination. Her emotions were always very near the surface, but in childhood a morbidity manifested itself and her memory now leads her to think that she spent most of her youth longing for death. She wet the bed until she was seven years old but had no other suggestion of

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epilepsy, excepting that she was shy, self-centered, emotional, and displayed a typical nervous tendency. At the age of twenty-two years her father met with financial reverses, and she had to work to help support herself and contribute to the family, and here, for the first time, it was necessary for her to make a number of adjustments in her life. She had no business education but more than the average intelligence and she entered a large office as a clerk. Within a year she was assistant to the head of the department, and as her salary increased she began to contribute to the education of a talented older sister. As she bettered her position she increased her responsibilities, so that at the age of thirty-one she was supporting herself, her mother and father, a younger brother who was in college and contributing to the support of two sisters who were studying music in New York. This burden does not suggest a selfishness of character, and yet the selfishness was present in her in a very great degree. Her personality was lively, vivacious and clever, but underneath this veneer she was cruel and ruthless. Her family held absolutely no place in her affections. She was entirely devoid of love for any of them, and still she had been supporting them for years because her mother, with uncanny accuracy, had played upon her egoism, and this by the rankest kind of flattery. The girl was wonderful, the mainstay of the family, their only support; she was worshipped, adored and palavered over incessantly. While she was entirely conscious of the fact that this was a small return for her sacrifice, still she was unable to withdraw from the situation.

This brief review of her family situation shows at least some of the difficulties which beset her, but the analysis brought to light another phase of her life.

Let me relate one of her dreams: She was walking on a hill somewhere near Seven Corners in St. Paul; on this hill the buildings flank the sidewalk and in it are many windows almost at street level. As she went down the hill she found the street blocked with a great crowd of horses which frightened her half to death. As she ran back up the hill there were many horses in each window of the building. She ran to a livery stable at the top of the hill and a man came to the door and told her she might go through the stable and out the back window, which she did. She climbed down a ladder, like a fire escape, to the street. When she finally reached the street and looked up the hill, all of the horses ran down the hill after her.

In this dream the motion, horses, horses' heads through windows and the escape and pursuit have a sexual significance. After the psychoanalysis was under way for about a month, she had related seven other dreams in which horses jumped on her, ran after her or frightened her in some other way.

This repetition in dreams is thought to have its origin in some traumatism and the following was the incident which gave rise to her horse dreams:

At the age of 23 years a man by whom she was employed part time finding that they were alone locked the office door and attempted to have his way with her. She struggled and then fainted. As she recovered consciousness, certain impressions of him made her think of him as a horse. This incident was so painful in her consciousness that she repressed it to the point where she had forgotten all about it, and, in addition, she had repressed all sexual desires by creating in her mind a hatred and contempt for all men.

This sketch then serves to add two more factors to her family and economic trials: those of traumatism and sexual repression. It is impossible to detail the effect that the necessity for adapting herself to these various situations had upon this girl, but as she bore them all she became increasingly irritable and tense. This displayed itself in a certain impatience with her work; with people who came in contact with her; in a feeling that she must get her work "done up" and by the rather stubborn tenacity with which she drove herself to accomplish her tasks. However, she carried on for about eight years, before she developed her convulsions.

To conclude this case: after explaining her situation to her and removing some of the mental difficulty and economic stress, this girl was free from convulsions for eighteen months, when she was lost from my observation.

As has already been said, epileptics are egoconscious and in the mind of each one of them there is a tangled mass of psychopathic material which promotes the difficulty they experience in adapting themselves to social and economic circumstances. According to L. Pierce Clark, a widely quoted author on the subject, the lack of social virtues, kindness, charity, love in the social sense, generosity and consideration for the feelings and rights of others, makes it difficult or impossible for them to make a social adjustment. The magnitude of their hypersensitiveness and egocentricity, combined with the degree in which the social qualities are lacking, he believes determines when, that is what time in life, they will develop their epilepsy. Those people who are very egocentric and hypersensitive and who are almost completely lacking in adaptability will develop it early in life, even if they are subject to little or no conflict with reality, while those people who have less pronounced character defects will only develop the disease when the stress of adapting themselves becomes relatively great.

While this theory of Clark's is attractive, no attempt is made to understand why epileptics should develop such a character, other than to throw the whole problem back to the unalterable factor, heredity, that is familial left-handedness, alcoholism or syphilis in the parents, hereditary burdening or such a vaguely descriptive term as the neuropathic diathesis.

In this communication no pretext is made of having solved the entire problem of epilepsy, but

the method of approach is somewhat different and it at least allows us to understand some of their reactions and ideals. Let me give an example:

An intelligent young man has had a reactive epilepsy for a number of years; it began at the age of nine. He has a vast psychopathic background, which contributes an emotional difficulty to his life. The stress in his life is briefly as follows: Since he graduated from school he has been employed by and supervised by his father, who is not only a hard taskmaster but has insisted on the young man assuming the duties of salesman, laborer, book-keeper, gardener, housekeeper and various other jobs, many of which were in competition with other healthy men. This competition, supervision, and the closeness of the family contact necessitated by his condition, has contributed to his irritability. However, to keep a certain amount of peace in the family, to hide his condition as much as possible from outsiders and to please people in business, he has assumed a certain unctuous, suave manner. The unctuousness is, of course, entirely assumed and words of endearment are plentifully scattered through his conversation, but his whole manner is so unconvincing that his efforts are clearly transparent and his effect shallow. This same man is exceedingly loquacious, bringing dates, names and circumstances into the conversation with great freedom. The purpose in this display is to convince himself, as well as his hearer, that there is nothing wrong with his mind.

Attention is called to this mechanism so frequently employed by epileptics because the literature on this subject describes the shallow feeling, the unctuous emotionalism, the superficial religiosity of the epileptic. The impression which their display of emotion makes on the observer is certainly superficial but it must be understood that their manner is purposely assumed to help them to make a social impression, and to cover up their real feelings. The very fact that they are so sensitive to the impressions which they create, and so fearful of criticism, makes them self-conscious and less able to carry off their role. If they begin to deteriorate mentally, the role they have assumed may deteriorate likewise until their utterances are disjointed phrases, religious, endearing or of superiority.

In the last case cited, reference was made to the manner in which he reassured himself of the integrity of his mental functions, and this suggests the idea that his hypersensitiveness also embraced his own body and mind as well as the impression he created in other people. In other words, was he critical of himself, and, if so, would the irritation which he felt with himself have any influence in producing the attacks? He was placed on relatively large doses of bromides so that his mental processes were decidedly slower. After the second day's administration he became very irritable. That night he had eneureses and continued to have it as long as the bromides were given. With the stopping of the bromides and the resumption of his normal mental activity, the eneuresis stopped. Whether the eneuresis was accompanied by a convulsion, or was a convulsion, cannot be told, but it may be assumed that it was one, or its equivalent.

This instance would seem to indicate that irritation arising from self-criticism was sufficient to bring on certain seizures, and further that he must have a certain ideal in regard to the manner in which his ego functioned. So, viewed from almost any angle, the emotions of the individual and their expression for the most part by irritability would appear to arise from a common source, the ego, and by ego is meant the individual's appreciation of self. If the whole fabric of epilepsy reverts back in every instance to egocentricity, then it would appear from the psychoanalyst's view, as has been asserted by Freud, that nothing can be accomplished by that method. Freud believes that the ego is a fixed point and that psychoanalysis can only be concerned with subconscious or unconscious matters which circulate about this fixed point.

This conception of Freud's is undoubtedly an artificial distinction made for teaching purposes, for a moment's consideration will convince you that egocentricity is a variable, which changes with a number of things. The invalid, for example, is more egocentric than the well person, but with the return of health the egocentricity largely disappears. This being true, the invalidism of the epileptic may determine to some extent his egocentricity, and so, even if Freud's "fixed ego concept" is true, egocentricity, or the degree of self-appreciation, is a variable quantity, and the causes for it lie within the scope of psychoanalysis. Psychoanalysis will remove some of the psychopathic mechanisms present and increase our understanding of their personality and their moods.

THE PHYSIOLOGY OF SPINAL ANESTHESIA*

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WITH the recent popularization of spinal anesthesia many attempts have been made to explain the various phenomena which take place. It was with the idea of correlating the explanations of these phenomena that this paper was written.

In spinal anesthesia or subarachnoid block, a block is produced which prevents impulses being conducted through the anterior roots to the spinal nerves, or in the reverse direction from the spinal nerves through the posterior roots to the spinal cord. The anesthetizing drug, novocain for example, sets up a chemical reaction with the nerve tissue producing a physiological block. This block occurs at the anterior and posterior roots of the spinal nerves within the dural sac, because here they are more sensitive to and more easily permeated by the drug.

Not all of the fibres in the nerve roots are similarly affected. Some fibres are more resistant than others. Evans[2] states that the fibres are blocked in the following order:

1. The fibres which carry pain and temperature sensations from the skin and viscera.
2. Those fibres which arise from the skin and convey the sensation of touch.
3. The fibres which carry impulses of pressure or movement from muscles.
4. The fibres which carry impulses to the skeletal muscles.
5. The sympathetic nerve fibres which receive stimuli from the viscera and send out, among others, impulses which regulate the vasomotor system.

Thus, one can see that those fibres having to do with the sensation of pain are most affected, while those having to do with vasomotor control are least and most fleetingly affected. Therefore, in spinal anesthesia, there is first loss of the sense of pain, then of tactile sense, then motor sense, then of muscle power, and finally of vasomotor control. As the depressant or blocking action of the drug wears off, conduction through the nerve fibres gradually returns to normal and the lost functions return in the reverse order.

The anterior nerve root carries the motor fibres, while the posterior nerve root carries the sensory fibres. The posterior or sensory root is more readily affected by the drug, thereby producing loss of pain, temperature and muscle sense, while the anterior root is affected to a lesser degree. Besides this, there are several factors which favor a more concentrated solution upon the posterior roots. The first of these is the point of injection. The anesthetizing drug is injected posteriorly and therefore must necessarily come in contact with the posterior roots first, and will be more dilute when it reaches the anterior roots. Secondly, the interarachnoid trabeculæ, between the arachnoid and pia mater, hinder to some degree the diffusion of the drug anteriorly. Lastly, the position of the patient, which is on the back, and the specific gravity of the injected solution, tend to keep the more concentrated solution about the posterior roots.

There are certain phenomena which accompany spinal anesthesia that are of considerable interest. One of the more important of these is the fall in blood pressure. There are three factors concerned here. The first of these is the loss of vasomotor control. Normally there is a balance set up between the vasoconstrictors on the one hand and the vasodilators on the other. This balance is regulated by the vasomotor center. Now, if the vasoconstrictors, which tend to keep up the blood pressure, are paralyzed, then the vasodilators are overactive, the blood vessels dilate, and the blood pressure goes down.

Experiments on animals have shown that, as the spinal cord is cut, various drops in blood pressure occur, depending upon the level at which the cord is severed. For instance, cutting the cord at the level of the first thoracic

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segment produces a maximum lowering of blood pressure. A mid-thoracic section would produce a less marked drop, while a section through the lumbar region would result in very little or no drop. The same mechanism is involved when spinal anesthesia is administered, and the degree of drop is determined to a large degree by the height of the anesthesia. In practice, this drop in blood pressure is overcome in some degree by the administration of ephedrin[6] or adrenalin, which act peripherally to stimulate the vasoconstrictors, and thereby maintain or elevate the blood pressure. Many cases* maintain the blood pressure at the normal level; others will show either a fall or a rise of ten to twenty millimeters, and only occasionally is the drop sufficient to cause any alarming symptoms.

The second factor involved in the blood pressure drop is the paralysis of the thoracic and abdominal muscles. By this paralysis the pumping or aspirating action of the thorax is lost or diminished and a smaller volume of blood gets to the heart. In other words, the minute volume is decreased.

The third factor is the slowing of the heart rate. Here again there are two nerve supplies which are antagonistic in their action—the vagus or inhibitory nerve, and the sympathetic or accelerator nerves. The vagus arises from the medulla and soon becomes extradural. The sympathetic nerves arise from the first to the fourth thoracic segments, and pass out as part of the anterior nerve roots. Thus, if the anesthetizing drug reaches these nerve roots there will be a block, and the amount of block will determine the amount of slowing of the heart rate. The vagus will become overactive and the heart rate will be decreased.

Another interesting phenomenon which is met with is that which, for want of a better term, is called "increased peristalsis" or "contracted gut." The same mechanism which explains the drop in blood pressure and the slowing of the heart rate will explain to some degree this last phenomenon of contraction of the intestine. In this case the sympathetic and the parasympathetic systems are again antagonistic. The sympathetic fibres arise from the lower thoracic and upper lumbar segments, while the parasympathetic impulses are carried through the vagi and the pelvic nerves. The vagus supplies the small intestine, the ascending and transverse colon, while the pelvic nerve supplies the remainder, *i.e.*, the descending colon, sigmoid, rectum and anus. The sympathetic fibres exercise an inhibitory action on the intestines and the parasympathetics a contraction. The fibres which make up the pelvic nerve are always paralyzed in a spinal anesthesia, as it arises from the sacral roots, so one can see why we have a contracted gut and a relaxed anal sphincter. There is a partial or complete blockage of the sympathetics, allowing the vagus and the intrinsic nerve supply to become overactive, resulting in increased peristalsis. Whether or not the antagonism between the sympathetic and parasympathetic nerves is as definite as it would seem here is doubtful. However, Alvarez[1] states that the first effect of stimulation of the vagus is generally a slight lowering of the tone of the stomach and bowel, and this is followed in a few seconds by an increase in tone and activity which may last for from a few seconds to a minute. He goes on to state that Spodolini and others have shown that one can get purely inhibitory effects by stimulating the vagus, just as one can get purely augmentatory effects by stimulating the splanchnics. Ordinarily the main effect of stimulating the splanchnics is an inhibitory one. Certainly, at least, the antagonism does not seem to be as definite as in the vasomotor system.

Lapicque[4] introduces a vital and novel theory to explain not only inhibition and anesthesia but fundamental selectivity in nerve reactions. According to his theory one neurone system can stimulate another only if the "temporal characteristics" of both are equal or nearly so. This "temporal characteristic" harks back to a hookup of nerve connections based not so much on direct continuity as in a set of electric bells or a telephone system, but rather as a "tuning in" arrangement such as obtains in radio. On such a basis any local or general anesthetic need not so much mechanically deaden pathways of sensation as to close them by changing their "vibration," "wave length," or "tuning in" properties.

If one eliminates the reflex nausea and vomiting brought on by manipulation of viscera

*Personal observations based on 600 inductions of spinal anesthesia for operations below the diaphragm.

in the upper abdomen, especially the stomach and duodenum, there remain two other factors which produce nausea and vomiting. The first of these is cerebral anemia, which is produced by lowering of blood pressure and slowing of the heart beat, and is relieved when these two phenomena return to normal. The second factor is that of psychic influence, and can be traced to poor appreciation of psychic factors on the part of the surgeon, anesthetist, or anyone who comes in contact with the patient during or just preceding the operation.

The cause of death in spinal anesthesia has received a good deal of attention, and the best evidence points to cerebral anemia rather than respiratory paralysis. Koster and Kosman[3] state that with a marked dilatation of blood vessels within the abdomen and the consequent tremendous fall in blood pressure, the venous return flow to the heart becomes so inadequate that not enough blood can be pumped out to the brain. Failure to supply blood to the brain in sufficient quantity results in a bulbar and cerebral anemia which is responsible for death in spinal anesthesia. When respiratory paralysis ensues, it is consequent to the cerebral anemia. Koster and Kosman[3] have done some very good experimental work to confirm this.

In conclusion, just a word about the duration of anesthesia. The factors which affect the length of anesthesia are the dosage and concentration of the injected drug. The average duration for upper abdominal operations is about one hour, for lower abdominal one and one-fourth to one and one-half hours, while for operations on the perineum and lower extremities many spinal anesthesias will last for one and three-fourths to two hours. There is also a personal variation. Patients having the same operation, and being approximately of the same size, all other things being equal, will often show a variation in duration of anesthesia. However, for all practical purposes the duration is sufficient to perform most major surgical procedures below the diaphragm.

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TREATMENT BY ROENTGEN RAYS IN OVARIAN DYSFUNCTION*

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WITH the rapid extension of radiotherapy to the numerous uses for which it is now recommended, a roentgenologist must be keenly aware of the danger of over-enthusiasm for any particular application because of the danger of later discredit to the entire field of treatment. However, it is equally important, not only for the roentgenologist, but for the surgeon and internist, to keep sufficiently in touch with rapidly developing clinical experience and the accumulating knowledge of the biologic reactions caused by the rays in graded doses on normal and abnormal tissue to give their patients the benefit of such treatment in conditions particularly amenable to it. The profession as a whole, as well as the radiotherapist, should know the relative susceptibility to the rays of the normal tissues of the body and of the different types of malignant growths, and it should know something of the potentialities of treatment by radiation in both acute and chronic inflammatory processes.

A newer field, and one which is in need of critical study, is the use of radiotherapy in certain endocrine dystrophies, particularly because in this field clinical criteria for the diagnosis of disease entities are inexact, and knowledge of the interrelationship of various glands is limited. For the last three years, Dr. Drips and I have been interested in the use of radiotherapy in low dosage in certain cases which may be regarded as representative of the state of ovarian hypofunction or dysfunction. In two previous publications we have considered more fully the basis of diagnosis of this condition and the development of both ovarian and hypophyseal irradiation in its treatment. With only brief recapitulation of the salient features of this syndrome and the technic of the treatment, I wish to present at this time reports of six cases to illustrate some of the possibilities of radiotherapy in low dosage in this field.

Ovarian dysfunction can be rather loosely defined by stating that in a certain group of patients abnormalities of menstruation and of reproduction (sterility or frequent abortion) can, by exclusion of any organic local or general disease or structural abnormality, be attributed only to incompetence of the ovaries themselves. The most common manifestation of this ovarian disturbance is lack of rhythm or cycle in menstruation, exhibiting either suppression of menses (oligomenorrhea or long periods of amenorrhea) or the reverse (too profuse, prolonged, or too frequent flowing). All combinations or interchange of the two phases of alteration are found. Intense dysmenorrhea, distinct from the obstructive type, frequently accompanies these disorders and sterility is likewise an almost invariable corollary.

On general examination, often confirmed by exploratory operation, little change from the normal pelvic conditions can be determined, or at least the variation in size, position, or condition of the uterus and ovaries is within the range of variation found compatible with normal menstruation in many persons.

To limit the group for more accurate study, Dr. Drips and I have endeavored to exclude cases of obvious pluriglandular dystrophy, although in some of these, undoubtedly, the same treatment may have an alleviating effect, and its use may be indicated. That the dysfunction represented is essentially an ovarian hypofunction is evidenced by the palliation afforded in many instances by the use of ovarian extracts and also by the similar symptoms which occasionally arise after pelvic inflammatory disease or after operations in which resection of the ovaries has been performed. Many of the more severe cases have proved intractable to the commercial preparations of ovarian substance now available and

*From the Section on Roentgen-Ray Therapy, The Mayo Clinic, Rochester, Minn. Read before the Association of Resident and Ex-resident Physicians of The Mayo Clinic and The Mayo Foundation, Rochester, Minnesota, October 8 to 10, 1929.

it is in these more resistant cases that treatment by roentgen rays is employed. Two methods of treatment have become fairly well standardized and are in use in many European and in some American clinics; namely, the application, to either the ovaries or to the hypophysis, of a very small amount of roentgen rays. The range of dosage is approximately 5 to 10 per cent of an erythema dose at the depth of the organ treated; rays of short wave length are used. Although we have had occasion to employ both forms of treatment, we have found the ovarian irradiation or a combination of both ovarian and hypophyseal irradiation more effective, as a rule, than the pituitary irradiation alone. Approximately two decades of observation of patients treated by this method, together with many experimental studies and some data based on histologic studies of ovaries from women following irradiation with this dosage, had not shown indication of harmful sequelæ to the patient or to the subsequent offspring. This latter point had been the alarm of the general profession or at least those unacquainted with the significance of dosage of rays in proportion to biologic reaction which can result. Few clinicians hesitate to subject a patient to roentgenographic examination and often repeated examinations of the colon, of the spine and pelvic bones, or of the urinary tract, on any suspicion of disease in these structures, but many of these same clinicians are strongly prejudiced against the use of an almost analogous amount of irradiation in treatment. The recent extensive survey by Murphy of the incidence of congenital or constitutional defects in children born to mothers who had previously been subjected to pelvic irradiation, often in considerable amounts, such as is used in the production of temporary sterility or in the treatment of fibromyomas, should answer conclusively these doubts.

Case 1.—A woman, aged twenty-two years, 5 feet 5.5 inches in height, weighed 170 pounds. Menstruation had begun at the age of thirteen years. It always had been irregular and scanty and had ceased suddenly six years before admission to the clinic. Since then she had menstruated only once and that two years before admission. She had had no vasomotor symptoms and no molimen.

The uterus was small, in the anterior position, movable, and the ovaries were palpable.

Previous treatment had included ovarian extract, 10 grains three times daily, for six months, and intravenous organotherapy, probably with corpus luteum. This treatment had been without results, and no medication had been given for one and a half years.

Irradiation of ovaries was given in June, 1928, and a reduction diet was advised. Supplementary treatment with organ compounds was not given. After irradiation the patient experienced some pain, low in the pelvis, for about a half hour every few days. Six weeks after treatment a dark, hemorrhagic vaginal discharge occurred which continued for five days. The patient returned in August, 1928, encouraged by this indication of return of ovarian function and anxious to continue treatment. Combined pituitary and ovarian irradiation was given. Since then menstruation had occurred every six weeks to the date of the last observation, August 5, 1929. Menstrual flow is normal for one and a half days, and then there is a brownish discharge for three days. The patient experiences slight pelvic discomfort with the periods; her general health is excellent.

Case 2.—A single woman, aged twenty-four years, 5 feet 4.5 inches in height, weighed 240 pounds. Menstruation had begun at the age of eighteen years. It always had been irregular, scanty, and associated with severe pain. There had been excessive gain in weight since puberty. She had frequent headaches.

The uterus was small and lesions were not found in the adnexa. The basal metabolic rate was +12. Obesity was graded 4. There were no acromegalic features.

Previous treatment had included appendectomy and bilateral salpingectomy for early tuberculous salpingitis, and puncture of small cysts in the ovaries, four years before admission to the clinic. Menstruation and general health had not improved following operation.

Irradiation of the ovaries was given in June, 1927, and a reduction diet was advised. Supplementary treatment with organ compounds was not given. Menstruation occurred regularly every month from June, 1927, to May, 1928, at which time septicemia with high fever occurred. Since then there has been no menstruation. During the time of regular menstruation the patient improved greatly in general health and her weight was reduced to 214 pounds.

Case 3.—A married woman, aged thirty-two years, 5 feet, 1.5 inches in height, weighed 213 pounds. Menstruation had been fairly regular until the patient was twenty-two years of age. Since then it had been infrequent and scanty, with intervals from two months to two years, and a rapid gain in weight. Hot flashes were frequent, and molimen was present. The patient desired children. Pseudocyesis occurred twice.

The fundus of the uterus was normal and movable, and lesions were not found in the adnexa. The basal metabolic rate was +15. Roentgenogram of the sella turcica did not show abnormality.

Previous treatment had included ovarian extract over long periods, which occasionally had caused a slight hemorrhagic discharge or increase of molimen.

Irradiation of one ovary was given in January, 1927,

a reduction diet advised, and agomencin (an ovarian preparation) prescribed to be taken for one week before the expected menstruation. Menstrual flow occurred two days after the irradiation and continued for one month, following which normal menstruation occurred from April to August, 1927. Each period lasted about one week. In August the patient became pregnant, and in May, 1928, gave birth to a female child; the child was well developed and apparently vigorous, but died two hours after birth from respiratory failure. The attending physician reported that the birth had been slow and difficult due to the extreme obesity of the mother, and he could account for the death of the child in no other way. Menstruation was reëstablished on one occasion following the birth of the first child before the second pregnancy occurred. A male child weighing 8.5 pounds was born in May, 1929. The child is now five months of age, weighs 16 pounds, and is healthy and well developed in all respects. The mother reports her health better than at any previous time; she mentions particularly that the soreness of the flesh of the entire body, which had been so noticeable during the periods of amenorrhea, is now relieved. Two menstrual periods have occurred since the last childbirth.

This has been the only case in our series in which pregnancy has followed reëstablishment of menstruation. Kaplan has published a series of thirty-eight cases treated for amenorrhea in which menstruation was reëstablished in thirty-two. In thirty of the group who were married and previously sterile, pregnancy occurred in eleven instances, two miscarried, and nine healthy children had been born. Linzenmeier also has reported his experiences, with similar results. Congenital defect attributable to irradiation was not present in any of the children.

Case 4.—A single woman, aged twenty-four years, had begun to menstruate at the age of twelve years. Menstruation always had been irregular, and the average interval between periods was six weeks. Intense dysmenorrhea had occurred for the last nine years. The most severe pain occurred on the first day and always required morphine for relief. The patient occasionally lost consciousness from pain before the hypodermic was given.

There was no pelvic abnormality.

Previous treatment included dilatation and curettage in August, 1925, without relief. Large doses of ovarian extract were taken two weeks before each period, but had given no result after several months' trial. A second dilatation and curettage and insertion of Baldwin tube, which remained in position for six weeks, was likewise without effect.

Irradiation of the pituitary gland was given in June, 1928. There was slight improvement of the period which immediately followed the irradiation. The treatment was repeated in July. The next two periods were much less painful. Because complete relief had not been obtained, an ovarian irradiation was added in September, 1928. Since then the patient has been either free from pain or experiences slight discomfort for a few hours at the beginning of menstruation. This discomfort is amenable to ordinary remedies such as aspirin.

Case 5.—A single woman, aged twenty-four years, had had severe dysmenorrhea for five years following appendectomy. The pain incapacitated the patient for work. Menstruation was irregular, with intervals of five to seven weeks, and there was pain and nausea one week to sixteen days before menstruation began. The patient was confined to bed with each period, vomiting every fifteen to thirty minutes during the first day. There was severe backache and abdominal cramps.

The fundus of the uterus was small and retroverted, and lesions were not found in the adnexa.

Previous treatment included ovarian extract, 10 grains three times daily for two weeks before the menstrual period, corpus luteum, and Hammond's mixture, without effect. Benzol stearate was given to relieve spasmodic pain at the time of the menstrual flow, but could not be retained because of vomiting.

Irradiation of the hypophysis was given in June, 1928. The July period was much better. There was a return of nausea with the next period, although the pain was less severe. A second pituitary irradiation was given in October, 1927. The patient was entirely free from nausea and pain until January, 1928. There was slight dysmenorrhea then, and apprehension of further trouble led to the third treatment. Since this time the patient has been well. She has completed two years of nurse's training since the second treatment, and has not lost any time from duty because of illness.

Case 6.—A single woman, aged thirty years, came to the clinic complaining of menstruation which, although regular, was profuse, and accompanied by intense pain for thirty-six to forty-eight hours. There was a marked state of chronic nervous exhaustion, due chiefly to dysmenorrhea.

The uterus was retroverted and the ovaries distinctly palpable.

Previous treatment included internal shortening of the round ligaments and dilatation and curettage in March, 1929. The ovaries were described by the surgeon as elongated (5 to 6 cm.) with heavy capsules, the surface of which presented rugæ. The cervical canal was not of the rigid type seen in obstructive dysmenorrhea. The menstrual periods in April and May were associated with the same intense pain.

Irradiation of ovaries and of the pituitary gland was given in May, 1929. There was marked relief from dysmenorrhea for the next two periods. A slight return of pain, relatively mild and of short duration, occurred with the third menstruation. The patient gained weight and strength. The amount of menstrual

flow was distinctly lessened. An examination in September, 1929, showed the ovaries still large and tender, and the uterus small and anterior in position. A second ovarian irradiation was given in September, 1929.

Treatment has not been equally successful in all cases; there have been some complete failures, but the results in over 50 per cent of the cases treated have demonstrated conclusively the potential effectiveness of the method. Improvement in results may be expected with more careful study of the types of dysfunction within the group as a whole, and perhaps through combinations of various irradiations of endocrine glands such as those recently advocated by Borak. With the development of more effective extracts of organs, radiotherapy probably will be superseded by direct substitution therapy, but in the meantime it would seem to have a definite field of usefulness.

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CASE REPORT

THE TETANOID SYNDROME IN PREGNANCY

REPORT OF CASE

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Saint Paul

In a recent article[1] it was suggested that a group of symptoms, rather commonly observed in pregnant women, probably due to a relative hypocalcemia, be considered as a tetanoid manifestation and that the group of symptoms be classed as the tetanoid syndrome. These symptoms are achy or crampy pains in the legs and thighs, an irritability of disposition unusual to the patient, insomnia, an edema apparently not associated with cardiac or nephritic pathology, and paresthesias of the extremities.

The symptoms comprising the tetanoid syndrome complicating pregnancy are nicely illustrated in the following case report. The patient is one of the series being studied at the Wilder Obstetrical Dispensary through the kindness of Dr. J. L. Rothrock, and I am indebted to the same source for the opportunity to interview the patient after delivery at the Miller Hospital and to study her hospital record.

Mrs. P. F., white, aged 36, gravida X, had one miscarriage at three months between her seventh and eighth pregnancies. Six children are living; three are dead—one due to convulsions at about three months of age, one to meningitis at three months, and one due to a six weeks premature delivery.

The patient herself had scarlet fever at fifteen years and was seriously ill at a hospital for six weeks. Chorea followed this illness and lasted for about four months. At sixteen she had an appendectomy. She has been under observation for tuberculous pleurisy which probably healed. She has also been treated for some tuberculous affection of the eyes. In spite of her illnesses and numerous pregnancies the patient appears strong, healthy and vigorous. Laboratory reports Kolmer Wassermann 4 plus, and Kahn 3 plus.

Her early pregnancies were uneventful. The seventh and eighth, however, presented symptoms identical with the ones here reported, except for the fact that they appeared during the eighth month while with this they appeared, in part, as early as the fourth month.

In this pregnancy edema of the feet and ankles appeared in the fourth month. Towards the latter part of her pregnancy she also had edema of the hands, while that in the lower extremities had become pronounced, pitting deeply on pressure. Varicosities became conspicuous in the later months; considerable areas about the legs and ankles were colored a deep bluish purple over the veins with the adjacent areas a washed-out indigo.

About four weeks before term insomnia became an annoying symptom; the onset of crampy pains in the legs and feet at the same time probably accounts for the insomnia in some degree. She became increasingly nervous and irritable and cried easily. When seen ten days before delivery at the dispensary she impressed one as being mildly hysterical, speaking of her various symptoms with tearful, anxious hopelessness. The urine was free from albumin throughout the pregnancy; B. P. 110/60. Her hands and feet often felt numb. She would pound her hands on her knees in an effort to get some feeling into them.

During the last month she made only one visit to the dispensary because walking was so difficult on account of pain in her feet.

On July 19 she was given 40 units of parathormone intramuscularly. At the same time she began taking calcilact, 1 teaspoonful four times daily. On July 20 the edema had almost disappeared. The paresthesias and crampy pains in the extremities completely disappeared. By the twenty-first the edema was entirely gone, together with most of the discoloration. She slept soundly. On the twenty-second she took a long walk, the first in many weeks. She went into labor on the twenty-second, and spontaneously delivered a baby weighing 8 pounds and 2 ounces after a labor lasting only four hours. This is remarkable in comparison with the two labors preceding, which both lasted five days, with babies weighing respectively 5 pounds 2 ounces and 6 pounds 8 ounces. The puerperium was afebrile throughout. She slept soundly, and was entirely free of nervous manifestations, edema, parasthesias, and cramps.

Discussion.—When one considers the demands made upon the calcium metabolism of the mother by the growing fetus, and by lactation, it is not surprising to find that occasionally the apparatus fails to fully satisfy the demands made upon it. It is an old observation that tetany develops more readily in either humans or animals during pregnancy and lactation, or even during menstruation, than at other times. "Rheumatic contracture of nursing women" was proposed by Trousseau in 1854 as a name for the condition. McCarrison[2] has observed the very marked tendency for the women of Gilgit Valley in India to develop tetany during pregnancy and lactation. Williams[3] gives Dibbelt's estimate of at least 0.17 grams of calcium oxide daily as the average demand for calcium during the second half of pregnancy. Bar (from Williams) calculates that in the last two months this must be increased to 0.638 grams daily.

It is difficult to observe edema in pregnancy without a sense of alarm. Our teaching has been to accept it as a manifestation of toxemia, and toxemia, in turn,

means grave warnings, anxiety, and complete disruption of any ordinary manner of living. Even when the diagnosis of toxemia is made questionable by the absence of the usual accompanying signs, it has been the conservative practice to treat such patients as potential toxemias. When nephritic pathology is absent, however, as in this case, and where other tetanoid symptoms exist, one may conclude that toxemia probably does not exist, nor even threatens; certainly the patient need not be subjected to the discomforts, anxiety—perhaps dangers—which attend anti-toxemia measures. The nature of the edema in this condition is uncertain. In the article referred to, Faltas' conception of it as an angiospasm is given, but this does not seem to be so likely as the idea that it is the result of an alteration in blood-vessel permeability due to the low calcium content of the blood.

Insomnia in these patients is often extremely annoying, not only to the patient herself, but to her physician as well, since she responds so poorly to the usual soporifics. The cause of this symptom is probably related to the other nervous manifestations, including the cramps and paresthesias, and as such would be an expression of the heightened irritability of the nervous system. The bearing of this condition upon the duration of labor has been elaborated somewhat in the reference and is one of its most important aspects. There is a relative inertia of the uterus and a tendency to post-delivery atony. It is in this type of uterus that the muscles may have the power to dilate the cervix, but fail in that expulsive force so imperative to the normal progress of the second stage. Such patients may labor for hours and days, suffering from the pains of labor and despairing because of their futility. The problem is usually solved by some type of operative delivery with a danger all the greater because of the exhaustion of the patient, the probable high level of the fetal head, and the (usually) frequent examinations made to ascertain the cause of the delay. It is remarkable that pituitrin has but little effect upon the uterine contractions in these patients; even extraordinary amounts may be given without perceptibly altering the rate or the force of contractions.

How often this condition may produce a prolongation of labor is not known. An effort is being made at the present time to determine the incidence of the condition in a considerable number of obstetrical patients being observed over a period of one year. Difficult labor due to a discrepancy between the size of the child and that of the birth canal or to unusual positions of the child must of course be ruled out. The chief indication of the condition must be the clinical history—and the condition should be relieved before its possible effect upon the progress of labor becomes apparent.

Treatment.—Measures tending to stimulate calcium metabolism are used, and calcium itself is given in some palatable form. Calcilact has been found an agreeable form to most patients, and four or five teaspoons of this may be given daily. Calcium chloride may be used intravenously, especially in the more severe forms. For stimulating calcium metabolism the parathyroid gland extract used intramuscularly is apparently the most effective agent. Viosterol may be used and seems adequate where the symptoms are comparatively mild.

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President's Letter

THE practicing physician has heretofore looked upon preventive medicine as a state function, to be performed by official boards of health. He has conceived of this function as applying to groups of people and in relation to the discovery and eradication of the causes of such diseases as tend to be endemic, epidemic and pandemic. He appears rarely to have sensed the idea that applied preventive medicine is also an individual matter and is just as surely a part of his business as is the treatment of measles, mumps, whooping cough or diphtheria.

It is certain that this attitude is very largely, if not wholly, responsible for school boards, health boards and lay health associations taking up such work as wholesale vaccinations against certain of the contagions.

The State Board of Health has ever stood ready to aid in making various biologic products for the prevention and cure of disease easily and cheaply available to public and physicians alike. The physician has been quick to avail himself of any such preparations when needed to aid in effecting the CURE of disease, but there he is apt to stop. He has been so ingrained in the habit of trying to cure disease after it has developed that he has been almost stone blind to the necessity of treating the unexposed healthy person for purposes of prevention.

The physician must become health-minded. He must learn to look upon himself as a health physician, *i.e.*, one who is ever on the alert for the recognition of the earliest and hidden signs of disease; one who is ever on the alert to avail himself and his people of the accepted methods for prevention of illness.

The campaign for wiping out diphtheria will be in full swing before long and it will become the duty of each and every one of us to aid earnestly in putting into effect plans for the general use of toxin anti-toxin.

It has been said that if every man, woman and child could be given preventive doses of toxin anti-toxin, diphtheria would be completely eradicated. What a boon that would be! What a boon to childhood! For it is in the tender years that this disease is most contagious, most easily overlooked and therefore most fatal.

The method by which this preventive treatment may be given to large numbers of children will vary in different localities. Whether it shall be done by local doctors, by the health department or by other agency is for the local profession to decide. It would seem that the logical way would be for the local profession to treat those who are not indigent; the rest should be taken care of at public expense.

Before any of this work can be done, however, the public must be apprised of the dangers of diphtheria, preventive value of toxin anti-toxin and its harmlessness.

It is our duty to live up to our ancient traditions. The public looks to us these days to PREVENT disease. They are calling to us. We cannot fail them! The physicians in every locality in the state should take the *initiative* in this work. They can commandeer all the organized health agencies to their service. They can, if they so desire, have the help of the extension service of their Committee of Hospitals and Medical Education, their Committee on Public Health Education, and of any individuals or groups they might consider helpful. They have but to ask to receive.

PHYSICIANS! START THIS CAMPAIGN OF EDUCATION AND CARRY IT TO ITS LOGICAL AND BENEFICENT CONCLUSIONS!

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

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MORE NARCOTIC LEGISLATION

No one is more anxious to prevent narcotic addiction than the physician, and the profession as a whole is only too willing to coöperate with the government regulations necessary to limit the use of habit-forming drugs to proper channels.

Various estimates have placed the number of narcotic addicts in the country at figures ranging from 15,000 to five million. The very nature of drug addiction makes accurate determination of the number of addicts impossible. Even though the low estimate is right every effort should be made to cut it down.

As a result of a seeming increase in the number of addicts in the country the Harrison Act was passed in 1914. Various amendments have been added from time to time and the Porter bills now before Congress have attracted attention to narcotic legislation.

The Harrison Act was supposed to direct the use of narcotics to legitimate channels. What it really was in the main to direct their use *in* legitimate channels. This was so evident that the public gained the impression that the law was directed against the medical profession. By inference at least the medical profession was blamed for a large part of the abuse of a most valuable drug. The fact remains that financial gain on the part of those selling narcotics illegally to addicts is the main cause for the spread of addiction. The percentage of addicts made so by careless physicians must be very small. The few unprincipled physicians who profit by aiding addiction cannot be too severely condemned and should be punished to the full extent of the law. Enforcement of law should be specially directed against such unprincipled offenders.

Certain provisions of the Harrison law have been needlessly strict and irritating to both physicians and pharmacists—so much so that certain pharmacists have refused to handle narcotics at all and certain physicians have refused to treat addicts for fear of penalties attached to infringement of over-rigid and ambiguous regulations. The physician must keep a record of narcotics administered in the office; must use special requisition blanks for morphine tablets; cannot order a prescription containing codein above a certain amount by telephone; must observe certain incomplete regulations in treating an addict in an institution, and so on.

Registration by physicians licensed to administer narcotics is required each year and an oversight does not relieve the physician of the pen-

alty, hich may be $2,000 or imprisonment for five years or both. As a matter of fact, anyone who violates or fails to comply with any provision of the Harrison law is liable to the same penalty.

As though the present law were not stringent enough in regulating physicians, now come the Porter bills mentioned in the editorial of the A. M. A. Journal of February 8, 1930. One of these bills has already been presented to the House and if enacted no physician who has been convicted of any offense against the present narcotic law, no matter how trivial, may ever be licensed to administer a narcotic again. All regulations are to be made by the Commissioner of Prohibition subject to approval of the Secretary of the Treasury. The physician whose rejection of application for a license is impending must show cause why a license should be issued or why his license should not be revoked—in other words is considered guilty until he proves his innocence. The defendant has no voice in determining the place of hearing, whether it be public or private, and no rights as to who shall be subpœnaed as witness. Only the Commissioner of Prohibition may pass on the evidence submitted. Provision is made for appeal to the courts from decisions rendered by the Commissioner.

The second Porter bill provides for the creation of a special Commissioner of Narcotics. As stated in the editorial this centralized bureau in Washington will have dictatorial right in determining what physicians licensed by the respective states shall be allowed to administer narcotics. We physicians will have a Mussolini in Washington to dictate whether or not we may prescribe narcotics. Such high-handed legislation merely sets the scene for trouble, and violations of a needlessly strict law will result.

The present and proposed narcotic legislation is missing the point. Instead of giving dictatorial power to a Bureau in Washington to regulate physicians, it would be far better to concentrate the energy of the Bureau on the illegal peddling of narcotics outside of the profession.

The regulations proposed in these Porter bills border on tyranny, and every physician in the state should do his part in defeating these bills. Write your representative in Washington.

APROPOS OF MEDICAL COSTS

Mark Hanna has been credited with the remark, "Money and machinery entered the world at the same time." He was interested in accumulating and using both—and time is according him much credit. Diagnosticians of social and political ills have not failed of late to feature the load placed on society by the recent triumphal expansion of medical service. Could this have been an isolated expansion while the mass of the people retained their former alignments we would not have so much of the criticism appearing in papers and magazines. A machine age, however, with revolutionary changes in money distribution; high wages, and long periods of unemployment; installment buying and poor family budgeting—these and many more trends have brought not only expensive but chaotic living.

One searches a long article in the American Medical Association Bulletin* for some tangible expression other than excellent historical references and philosophical applications; some intimate criticism of doctors that minimizes their human frailties and points to their group salvation. Doctors are just as much out of social adjustment as other restless groups. We also have been touched by those agencies mentioned by the famous Ohio senator. Who, among us, have bought more cars than doctors, or more radios or cities' "serpents"! The generation before us bought fast horses and profitless farms. We need some of that epicurean advice which "calls not so much for an increase in our estates as a decrease in our desires." A reader chuckles and quotes the Chinese proverb for the benefit of this writer: "The mandarin from his chair sings of the many blessings of poverty!" No medical doctor of today, blessed with even a fair personality, need fear impoverishment. If it is his lot, it may be from accident, but can usually be traced to an overgreediness for fees, an overestimate of his own powers and prerogatives, or an asinine eagerness in investment which sends him "out wool gathering," but returns him "well shorn." Therefore, a lot of this preachment about chang-

*Hall, Harry M., A. M. A. Bulletin, Vol. 24, No. 9, p. 230; "DesCartes Was Right."

The article begins with the quotation, "If ever the human race is raised to its highest practicable level intellectually, morally and physically, the science of medicine will perform that service."—*Rene DesCartes.*

ing the attitude of the public toward us is plain bunk.

Let us adjust ourselves, our attitudes, our fees and hospital costs, to meet fair human needs. Before we launch tumultuous propaganda in order to adjust our patients to our ideas, let us practise a few adjustments among ourselves. It is difficult indeed to keep up with the strides in our own profession; it is necessary to attend many medical meetings and to organize our work at home. No better means of keeping the public with us has ever been devised than to let them know by our work that we are alert and ever seeking the light. Just as we must deal with individuals who need our attention, the public in turn must deal with us largely as individuals.

Medical service must remain a piece of handiwork that machine methods and mass production cannot well do. Louis XIV paid two hundred thousand dollars to the man who dared lance his royal rectum. At the same time, most of his subjects defended their health with charms, grog and prayer. Grog is still considered notably effective by a large percentage of our population. There are obviously gross inequalities in the capacity or ability of people to meet the cost of accident and disease. The one notable equality is that of desire, whether it be in terms of luxuries or necessities. Hence it is that many good folks assume needless burdens of medical and hospital expense, and doctors for the most part find it most difficult to keep them from doing so. For a considerable portion of our economically soundly organized countries a king with empyema gets about the same treatment as does his meanest servant. Indeed, we may answer DesCartes: "Some parts of the world have been remade by doctors."

E. L. T.

CASCARA-AGAR NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that, under the name "Cascara-Agar," the Reinschild Chemical Co. markets a preparation stated to contain "15 per cent of a watery percolation of two-year-old cascara bark, which is processed into No. 1 Agar, cut to size" and is recommended for use in constipation. It is stated on the trade package that the preparation is: "A harmless vegetable addition to breakfast food. Each teaspoonful contains a mild and specially prepared solution of Cascara Tea." Since no statement as to the amount of cascara contained in the product was given, the firm was asked to make a plain statement of the constituents of the product. The firm replied giving the method of preparation of the product. However, since no details were given as to the method used to "debitter" the cascara, one cannot say how much of the active principle of cascara was lost in the process of preparation and therefore the amount of cascara in a given quantity of the finished product cannot be judged. Experiments carried out lead to the conclusion that "Cascara-Agar" contains at most only a trace of cascara, and that it is misleading to call the preparation "Cascara-Agar." Information was received that the Reinschild Chemical Co. still markets "Regulin," a product which has been stated to be prepared in the same manner as is "Cascara-Agar." Since the Council does not accept an article under one name if an essentially similar product is marketed by the same firm under another name, this makes "Cascara-Agar" further objectionable. The Council declared "Cascara-Agar" unacceptable because it is an indefinite mixture marketed under a misleading name with unwarranted therapeutic claims, and because an essentially similar product is marketed by the same firm under another name. (Jour. A. M. A., October 26, 1929, p. 1309.)

ANAYODIN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Anayodin was presented by the Ernst Bischoff Co., Inc., with the statement that it was composed of iodoxyquinolin-sulphonic acid with the addition of 22 per cent sodium bicarbonate, and that from the information before the Council it appeared that Anayodin was a mixture prepared from approximately four parts of 7-iodo-8-hydroxy-quinolin-5-sulphonic acid and one part of sodium bicarbonate, which during recent years has been used in the treatment of amebic dysentery while similar preparations under various trade names had before this been proposed as wound antiseptics. The Council informed the Ernst Bischoff Co., Inc., that, since it was not the discoverer of the preparation, the Council could not recognize a proprietary name for it, but, unless other conflicts appeared, its product would be accepted if marketed as chiniofon, which name the Council had adopted for the mixture represented by "Anayodin," if acceptable tests were provided to insure its purity and uniformity and the advertising revised to meet stated objections. Ernst Bischoff Co., Inc., did not make its preparation acceptable and, accordingly, the Council declared "Anayodin" unacceptable for New and Non-official Remedies because it is an unoriginal preparation, marketed under a non-informing name without an adequate statement of composition; because no evidence was available to show that its identity and uniformity are adequately controlled; and because it is marketed with therapeutic claims which are unwarranted. (Jour. A. M. A., October 5, 1929, p. 1065.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

How Shall the Doctor Be Paid?

An important current magazine devotes its entire issue to this timely subject and every medical man should find something of interest to him in the discussion. The vexing question of the cost of health is discussed from the angle of the physician, of the economist, the business man, the public health expert and a large number of others who have interesting things to say on the ways and means of extending that commodity as far as possible at a proper cost in the January *Survey Graphic*.

Few of these experts are able to do more than offer pertinent observations. The answer to the problem of medical costs which are at once fair to the purchaser and to the doctor is apparently quite too complicated for any one man's solution. However, here are a few pertinent quotations from these entirely unacrimonious discussions, all of which are illuminating if not conclusive.

"Health is quite as much a social as a personal necessity and if this is admitted there is no dodging the individual and collective privilege and hence duty of attaining as much of it as the medical and social sciences have to offer. Knowledge, indeed, is pooled but its distribution for use is much after the fashion of April showers. It is time the users tapped the pool with a strong sky scraping plan of living." Thus Dr. Haven Emerson, health editor of the *Survey Graphic* and professor of Preventive Medicine, Columbia University, in a somewhat figurative flight which serves as introduction to the survey.

"If, as is generally supposed, doctors' fees are a preponderating item in making adequate care impossible," says Dr. George Edward Follansbee, chairman of the Judicial Committee, American Medical Association, "it would follow that a vast sum is flowing into the pockets of the medical profession. . . . Each doctor knows comparatively and probably closely the incomes of his fellow practitioners. His guess is that the income of a large portion of the profession will average in the neighborhood of $5,000 to $6,000 a year. An income of $5,000 to $6,000 a year does not appear to be excessive for a man who has spent his life up to 28 years of age in study and preparation and some $12,000 in expense before he begins earning."

Walton H. Hamilton of the Yale Law faculty, writing as economist, patient and parent, takes up the discussion at this point. "The technology of medicine has advanced," he remarks. "Its organization has lagged. . . . The problem of mending our arrangements so that the ordinary man has a real chance at adequate service and at a tolerable cost needs to be attacked in the way disease is attacked. The right answer is probably that there is no right answer. In the spirit of constructive inquiry we can only seek the rightest answer we can find."

"Only the well-to-do and the dependent in Columbus [Ohio] have the medical care at child-birth approximating modern standards" is the conclusion of Mary Louise Mark of the Ohio State University faculty who inquired into and analyzed the costs and service to 540 "run-of-the-mill" babies in Columbus. "The very poor and the lower range of those classified as intermediate have far from satisfactory care. The more intelligent of the parents in close circumstances are the chief sufferers because they are conscious of the risks involved for both mothers and babies."

"Any business which is organized in such a way as to discourage the masses from becoming customers is not on a solid economic basis no matter how excellent its scientific attainment may be," observes Edward A. Filene, who, as president of William Filene's Sons Company of Boston, has brilliantly demonstrated his knowledge of successful business.

"The health department can help the doctor increase his legitimate private practice through its program in diphtheria immunization, for instance," declares Dr. Shirley W. Wynne, New York City's Commissioner of Health. "But the doctor must remember that once a health department embarks upon a program to encourage people to go to a private practitioner he must do his part to keep that patient by his professional competence, moderate charges and effective follow-up work."

The industrial hospital, the pay clinic, certain Canadian experiments in sickness insurance and outlines of the work of the foundations to fight disease also occupy pages of the survey.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of March will be as follows:

March 5—"High Blood Pressure"
March 12—"Self Medication"
March 19—"Bronchitis"
March 26—"Paralysis of Face"

MINNESOTA STATE MEDICAL ASSOCIATION

Plans for the program of the annual meeting of the Minnesota State Medical Association to be held in Duluth July 14, 15 and 16, are well under way.

The symposia on traumatic surgery, immunology, cancer, rheumatic fever, anesthesia and therapy suggested as program headliners by the program committee have been approved by a majority of association members. The interesting and important aspects of each are accordingly being apportioned to the three days' sessions with the most distinguished men available to lead discussion and demonstration. Among the latter is Dr. Homer F. Swift, New York, who has been asked to discuss rheumatic fever.

Interesting and unusual entertainment is also being arranged for wives of members who attend.

UNITED STATES PHARMACOPŒAL CONVENTION

The eleventh decennial United States Pharmacopœal Convention will convene in Washington, D. C., May 13, 1930. Eligible organizations and colleges should obtain credential blanks from the Secretary of the Convention, Lyman F. Kebler, M.D., 1322 Park Road, N. W., Washington, D. C. Organizations entitled to representation at the convention include Medical Schools, State Medical Associations, and the American Medical Association.

UPPER MISSISSIPPI MEDICAL SOCIETY

The annual meeting of Upper Mississippi Medical Society was held Jan. 30, 1930, at Brainerd, Minnesota, Dr. T. C. Davis presiding. Minutes of the previous meeting were read and approved.

The annual financial statement showing a certificate of deposit of $446.49 and balance in checking account of $493.36—total cash on hand $939.85—was read and accepted.

The Board of Censors reported favorably on the application of Dr. Knute Holmgren, Upsala, Minn. It was moved, seconded and carried that the rules be suspended and the secretary cast the unanimous ballot for Dr. Holmgren, who was thereby declared duly elected to membership in the Upper Mississippi Medical Society.

Meeting places were selected for the year 1930 as follows: Spring meeting, Wadena; summer meeting, International Falls, preferaby during the month of July; fall meeting to be arranged if possible in joint session with the Stearns-Benton County Society, the place of meeting and time to be decided by the presidents and secretaries of the two societies.

Officers elected for the ensuing year are: President, Dr. G. I. Badeaux, Brainerd; First Vice-president, Dr. W. A. Miller, New York Mills; Second Vice-president, Dr. A. F. Gaalaas, Wadena; Secretary, Dr. F. F. Kumm, Wadena. Dr. J. A. Thabes and Dr. J. S. Grogan were elected delegates to the state meeting, with Dr. B. W. Kelly and Dr. F. F. Kumm as alternates. Dr. J. A. Thabes was re-elected censor for a period of three years.

The following resolution was adopted: Inasmuch as it is reported that there is at the present time in some parts of the State a desire to reduce the State dues, be it hereby resolved that it is the sentiment of the Upper Mississippi Medical Society that the State Association has done efficient work in the past few years and that this has been made possible by the increased dues; that any reduction in dues would be detrimental to the efficiency of the Society and that our delegates be so instructed and that a copy of this resolution be sent to the State Secretary.

The scientific program included the following presentations:

Treatment of Vomiting of Pregnancy
Dr. Milton G. Brown, Brainerd

Present Method of Treatment of Tuberculosis
Dr. F. F. Kumm, Supt. Fair Oaks San., Wadena

An Informal Surgical Discussion with Lantern Slides
Dr. Harry Ritchie, St. Paul

The Effects of Sun in the Prevention and Treatment of Disease
Dr. W. R. Ramsey, St. Paul

Discussion of State Problems
Dr. S. H. Boyer, President of Minnesota State Medical Society, Duluth

Moving Pictures
Surgical Treatment of Peptic Ulcers
(Davis & Geck)

Resolutions thanking the doctors appearing on the program were passed by the society.

The meeting adjourned.

G. I. Badeaux,
Secretary.

RICE COUNTY MEDICAL SOCIETY

A meeting of the Rice County Medical Society in conjunction with the Auxiliary, Nurses and Doctors' wives, was held February 6 at the State School for the Feeble Minded at Faribault. Dinner was served at 6:30 p. m. in the Main building under the auspices of Dr. and Mrs. Murdoch.

Dr. George Earl, Saint Paul, presented two subjects: (1) "Surgical Indications (non-thoracic) in the Minimal Tuberculosis Patients" and (2) "Economic Changes in the Practice of Medicine." Response on the part of members was led by Dr. W. D. Beadie, superintendent, Cannon Falls Sanitarium, and Dr. D. E. McBroom, superintendent at Cambridge.

Dr. W. E. Wilson of Northfield expressed appreciation and thanks to Dr. and Mrs. Murdoch for their generous hospitality in behalf of the society. Dr. Murdoch in turn expressed hearty appreciation to Dr. Earl for his instructive and interesting talk.

Mrs. Adolph M. Hanson, in the absence of Dr. Hanson, expressed gratitude and appreciation for the friendly attitude and assistance accorded Dr. Hanson in his research work on Karkinolysin for the treatment of malignancy, by the members of Rice County Medical Society and others.

Mrs. M. L. Mayland, Secretary of the Auxiliary, briefly outlined the aims and objects of her society.

Dr. Norman Lende, Faribault, was unanimously elected to membership.

C. J. Plonske,
Secretary.

OF GENERAL INTEREST

Dr. Clyde H. Fredrickson, formerly of the Mayo Clinic, Rochester, where he held a surgical fellowship, is now associated with the Great Falls Clinic, Great Falls, Montana.

Dr. Mary C. Ghostley of International Falls will act as superintendent of the Lake Julia Tuberculosis Sanatorium, Puposky, Minnesota, in the absence of Dr. R. L. Laney, who is taking a year's vacation.

Dr. Frederick W. Schlutz of Minneapolis, for sixteen years associated with the University of Minnesota Medical School and since 1924 Professor of Pediatrics, will move to Chicago about April 1st to become Professor of Pediatrics at the newly formed Department of Pediatrics at the University of Chicago.

The Secretary of the Minnesota State Medical Association announces that the American Commission of the International Hygiene Congresses invites us to send a representative to the word health sessions to be held in Dresden May 15 to September 30, 1930. If there is anyone expecting to be in Dresden, or if there is anyone who wishes to make the trip, which will cost $774, application should be sent to Dr. E. A. Meyerding, 11 West Summit Avenue, Saint Paul.

Dr. Leland S. Fuller of Chicago has joined the Morsman Eye, Ear, Nose and Throat Clinic of Hibbing and Virginia. Dr. Fuller comes from Cook County Hospital, where he has recently completed a service in the eye, ear, nose and throat department. He is a graduate of Rush Medical College. The personnel of the Morsman Clinic is now as follows: L. W. Morsman, M.D., Fred McK. Ruby, M.D., Andrew Sinamark, M.D., and L. S. Fuller, M.D.

A gold medal will be given to the best scientific exhibit submitted by any single individual at the Annual Meeting of the Minnesota State Medical Association in Duluth, July 14, 15 and 16.

This is the first award of the sort ever given. Its object is to encourage private participation in exhibits and it is the gift of the Southern Minnesota Medical Association, which proposes to use the surplus in its treasury for the purpose.

Dr. Owen Wangensteen was appointed chief of the Department of Surgery at the University of Minnesota Medical School, January 1, 1930. Dr. Wangensteen received his B.A. degree in 1919 and his M.D. in 1922. In 1925 he received his Ph.D. degree after three years' work in Medicine on the campus and at Rochester, Minnesota. Upon the resignation of Dr. Arthur Strachauer as chief of the surgical department in 1925, Dr. Wangensteen was selected to succeed Dr. Strachauer and availed himself of the opportunity to pursue special studies here and abroad in preparation for his present position. He studied in Europe between August, 1927, and September, 1928, under Dr. Fritz de Quervain at Berne, Switzerland, and in the physiological laboratory there, under Dr. Leon Asher, in addition to visiting numerous medical centers in Europe.

Sixty officers, chairmen and committee members of the Minnesota State Medical Association attended a meeting called by President S. H. Boyer for the purpose of coördinating association activities at the Leamington Hotel, Minneapolis, February 10.

"Attendance and interest displayed at this meeting were more than satisfactory," Dr. Boyer declared. It was the first meeting of the sort in the history of the Association.

A plan for an extension course particularly impressed the meeting. It is to include evening programs of the Minnesota Public Health Association; serum and vaccine therapy, heart disease, the State Board of Health, subjects of scientific interest, such as dermatology and lectures, to be provided by the Extension Division of the University of Minnesota.

A similar meeting of the chairmen will be called by Dr. Boyer this spring.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry.

ABBOTT LABORATORIES, INC.

Butesin Picrate Eye Ointment

LAKESIDE LABORATORIES, INC.

Ampoules Dextrose (d-Glucose) 10 Gm., 20 cc.

Ampoule No. 51 Sodium Cacodylate 0.243 Gm. (3¾ grains), 5 c.c.

H. K. MULFORD CO.

Pneumococcus Antibody Solution, Types I, II and III Combined-Mulford, four 50 c.c. double-ended vials.

The following articles have been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1929, p. 481):

DAVIES, ROSE & CO., LTD.

Pil. Digitalis (Davies, Rose)

KINGS COUNTY PACKING CO.

Sac-A-Rin Brand California Bartlett Pears

Sac-A-Rin Brand California Tidbits Hawaiian Pineapple

Sac-A-Rin Brand California Royal Anne Cherries

LAKESIDE LABORATORIES, INC.

Ampoule No. 64 Calcium Chloride 10%

TRUTH ABOUT MEDICINES

Diphtheria Toxoid-National.—A diphtheria toxoid (New and Non-official Remedies, 1929, p. 368) prepared from seven-day cultures of the diphtheria bacillus that yield a toxin having an L+ dose of not less than 0.25 c.c. The toxin is treated with formaldehyde. The finished product is tested for antigenic potency. The product is marketed in packages of three vials (one immunization treatment); in packages of one vial (fifteen immunization treatments); packages of forty-five vials (fifteen immunization treatments). The National Drug Co., Philadelphia.

Scarlet Fever Streptococcus Antitoxin-Cutter.—A scarlet fever streptococcus antitoxin (New and Non-official Remedies, 1929, p. 350) prepared by the method of Drs. Dick by license of the Scarlet Fever Committee, Inc. It is marketed in packages of one syringe containing 2,000 units, and in packages of one syringe containing 6,000 units. Cutter Laboratory, Berkeley, Calif.

Typho-Bacterin Mixed (Triple Vaccine TAB).—This product (New and Non-official Remedies, 1929, p. 380) is also marketed in packages of thirty 1 c.c. vials, being ten immunizations of three doses each. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., January 4, 1930, p. 31.)

Ampules Sodium Cacodylate-Mulford, ¾ grain, 1 c.c.—Each ampule contains sodium carcodylate (New and Non-official Remedies, 1929, p. 73) 0.05 Gm. (¾ grain) in c.c. of sterile solution, with 1 per cent of benzyl alcohol. H. K. Mulford Co., Philadelphia.

Ampules Sodium Cacodylate-Mulford, 3 grains, 1 c.c.—Each ampule contains sodium cacodylate (New and Non-official Remedies, 1929, p. 73) 0.2 Gm. (3 grains) in 1 c.c. of sterile solution, with 1 per cent of benzyl alcohol. H. K. Mulford Co., Philadelphia.

Ampules Sodium Cacodylate-Mulford, 5 grains, 1 c.c.—Each ampule contains sodium cacodylate (New and Non-official Remedies, 1929, p. 73) 0.32 Gm. (5 grains) in 1 c.c. of sterile solution, with 1 per cent of benzyl alcohol. H. K. Mulford Co., Philadelphia.

Erysipelas Streptococcus Antitoxin (Concentrated)-Mulford.—This product (New and Non-official Remedies, 1929, p. 349) is also marketed in packages of one 10 c.c. syringe containing 500,000 protective units. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., January 11, 1930, p. 105.)

Curdolac Casein-Bran Improved Flour.—A flour prepared from casein, carbohydrate-free bran, and soya bean, to which leavening and flavoring have been added. It may be used for the preparation of muffins or bread having a comparatively low carbohydrate content and low food value, with bulk. Curdolac Food Co., Waukesha, Wis.

Curdolac Soya-Bran Flour.—A flour prepared from soya bean and a starch-free bran with a leavening mixture. It may be used for the preparation of bread and muffins for use in diets in which a comparatively low carbohydrate content is desired. Curdolac Food Co., Waukesha, Wis.

Curdolac Breakfast Cereal.—A medicinal food prepared from soya beans blended with wheat products, including starch-free bran. It may be used as a hot food in diets in which a comparatively low carbohydrate content is desired. Curdolac Food Co., Waukesha, Wis.

Curdolac Casein Compound.—A flour prepared from casein, vegetable fiber and a leavening mixture to which sodium chloride and gluside are added. It may be used for the preparation of carbohydrate-free bread, muffins, cake, etc., for use in diets in which a relatively low carbohydrate content is desired. Curdolac Food Co., Waukesha, Wis.

Curdolac Soya Flour.—A flour prepared from the soya bean. It may be used for the preparation of foods in diets in which a relatively low carbohydrate content is desired. Curdolac Food Co., Waukesha, Wis.

Curdolac Wheat-Soya Flour.—A flour prepared from soya beans, starch-free bran and a small proportion of wheat, with leavening and flavoring. It may be used for the preparation of muffins, cakes, waffles, etc., of well balanced food value for use in restricted diets. Curdolac Food Co., Waukesha, Wis.

Curdolac Soya-Cereal Johnny Cake Flour.—A flour prepared from soya beans and cereal products to which leavening and flavoring have been added. It may be used in the preparation of muffins, cakes, waffles, etc., for use in diets relatively low in carbohydrate, designed for those who cannot use products made with bran. Curdolac Food Co., Waukesha, Wis.

Curdolac Soya-Bran Breakfast Food.—A medicinal food prepared from soya beans and a starch-free bran, to which has been added leavening, flavoring, gluside, and oils without food value. It may be used in diets in which a low carbohydrate content is desired. Curdolac Food Co., Waukesha, Wis. (Jour. A. M. A., January 18, 1930, p. 185.)

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a patient, forty-two years old, with a lump in the breast. I wish to know how to make a biopsy, and what the diagnostic possibilities are.

Answer.—The indications for a biopsy of a lump in the breast in a woman past thirty years of age are very definite. While attachment to the skin with dimpling and retraction of the nipple are suggestive of malignancy, no absolute diagnosis can be made without removing the entire mass. Many malignant tumors are not attached to the skin nor do they show retraction of the nipple. While the consistence of the mass on palpation is helpful, very hard tumors are sometimes proven to be benign on biopsy. The presence or absence of enlargement of the lymph nodes in the axilla is not helpful because they may be enlarged from another cause.

The ideal method for preparation for a biopsy is to get the patient ready for a radical resection of the entire breast and axillary contents. The skin should be prepared in the usual way, and the axilla shaved. Many surgeons use local anesthesia to remove lumps which they believe to be benign, so that if there is any delay in getting the report no time is lost with a general anesthesia. We will assume that the lump can be removed under local anesthesia. Infiltration with novocain can be done, and the entire mass excised. In no instance should the lump be cut into before removal. After the mass and surrounding tissue have been removed, it is advisable for the surgeon to make an incision through the tumor. In 95 per cent of the cases, a diagnosis can be made on the gross appearance. If the tumor is very hard and shows no definite border, it is probably malignant. If in addition, the surface is concave and there are multiple yellowish points present, it is malignant. In only 5 per cent of the cases is it necessary to resort to the frozen section. Many mistakes are made on rapidly made frozen sections, and it has been found advisable to rely on the gross appearance. If the mass is a fibroadenoma, it may be recognized by the sharp border. A definite capsule is present. When a fibroadenoma is incised, the edges bulge because the tumor is growing under pressure in a limited area. The surface of fibroadenomata varies from hard structures to the soft appearance of a rapidly growing tumor. Rapidly growing tumors are often found in conjunction with pregnancy or lactation. Cystic disease has a variable appearance. Sometimes there is nothing more than a diffuse induration which is not hard in which may be found either small or large cysts. Sometimes these masses prove to be a single cyst filled with fluid under pressure. Traumatic fat necrosis also gives a similar appearance to malignancy grossly, but the characteristic signs of a malignant tumor are absent. On section, fat necrosis shows definite changes which are very characteristic. If the mass is due to tuberculosis, a similar change, characteristic of the disease, will be found in the frozen section.

When a diagnosis of carcinoma is made, there is only one treatment to be done, providing metastases have not been demonstrated elsewhere before the biopsy is made. It is always wise to search the supraclavicular space and to do an *x*-ray of the chest in suspected cases. Only radical breast amputations should be done if the tumor has not extended beyond the breast and axillary contents. There is no known way of making an accurate clinical diagnosis. The practice of waiting to see what will happen to a lump in the breast is very bad. Many women have lost their only chance by local treatment.

2. *Question.*—Please give me the main points in the diagnosis and treatment of gas gangrene.

Answer.—Gas gangrene is a condition found in certain kinds of wounds, and is characterized by rapid spread, extensive destruction of tissue, foul discharge, and the formation of gas in the tissues. It always occurs secondarily to a wound. The odor is of a very peculiar, pungent quality, and once smelled is never forgotten. A characteristic finding is a sensation of crepitus in the tissue. The extent of the process can also be confirmed by an *x*-ray of the affected part. When opened, the muscles show a definite, dark, reddish brown discoloration and do not contract when stimulated. From 80 to 90 per cent of all cases are due to the bacillus welchii.

An antitoxin has been known since 1917. It is an antitoxic serum prepared from the blood plasma of horses, highly immunized against the toxin of bacillus perfringens or bacillus welchii. It may be purchased under the name perfringens antitoxin. For prophylaxis, 25 units are used. For treatment, an initial dose varies from 40 to 100 units, given intramuscularly followed by 40 units intravenously. From 40 to 80 units intramuscularly are given each day thereafter as indicated. The bacillus welchii is found in the intestinal tract of nearly all adults and about 40 per cent infants under one year of age. It forms spores under certain conditions and is liable to live in soil for a considerable time. It is possible to develop human infections from soil contaminated with human excreta. After the antitoxin is given, it is advisable to trim away all necrotic tissue and irrigate the wound with Dakin's solution. The use of hydrogen peroxide packs and irrigations is also recommended. If an extremity is involved, amputation is usually done. Gas gangrene, if it is not treated, practically always terminates fatally in from forty-eight to seventy-two hours. The condition must be recognized early and the proper treatment done at once. Favorable statistics were compiled during the war, and the evidence in favor of serum has grown since. The antitoxin may be purchased in three strengths, which includes the double strength and the concentrated preparation. Tetanus must also be kept in mind with these wounds, and many investigators use both sera in badly infected cases.

OBITUARY

Louis M. Benepe
(1862-1930)

Dr. Louis M. Benepe of Saint Paul died at his home February 14, 1930, after an illness of five months. He was 67 years of age and had practiced in Saint Paul for forty-two years.

Dr. Benepe was born in Columbia, Missouri, October 27, 1862. He was a graduate of Valparaiso University in Valparaiso, Indiana, and obtained his medical degree at Missouri Medical College in Saint Louis. He came to Saint Paul in 1888.

Dr. Benepe had been a member of the Ramsey County Medical Society since 1891, and had also been on the medical staffs of the Ancker, St. Joseph's and St. Luke's hospitals. He was also a member of the Triune Lodge, Knights of Pythias, and of the Damascus Commandery, Osman Temple of the Shrine.

Dr. Benepe is survived by his widow, Mrs. Leila A. Benepe; five daughters, Ruth and Alice Benepe, Mrs. Helen Vandersloot, Mrs. D. L. Cummings, all of Saint Paul, and Mrs. Frank Munoz of Wichita, Kansas; three sons, Dr. Louis M. Benepe, Jr., of Saint Paul, Dr. James L. Benepe of Dent, Minnesota, and R. S. Benepe of New York City. One brother, Dr. John Benepe of Anderson, Indiana, also survives him.

Paul Burns Cook
(1877-1930)

Dr. Paul B. Cook, well known specialist in urology and dermatology, of Saint Paul, died February 9, 1930, at Miami Beach, Florida. Dr. Cook had practiced in Saint Paul for over twenty-five years and since 1919 had been associated in the practice of his specialty with Dr. Charles Freeman.

Born in Rochester, Minnesota, the son of George Clinton and Elizabeth Burns Cook, on February 17, 1877, Dr. Cook obtained his M.D. degree at the University of Minnesota in 1900. He joined the Ramsey County Medical Society in 1902, was vice president of the Society in 1906, and in 1907 spent a year studying abroad, spending most of the time in Vienna. In 1911 and 1912 he acted as Assistant Health Commissioner and instituted valuable methods in the administration of the office.

Dr. Cook was one of the first medical men in Saint Paul to enlist, and after preliminary training at Fort Riley and serving at Camp Funston, he went abroad as Major in the 88th Division. Fond of travel, the foreign shores visited by Dr. Cook included Hawaii, another trip to Vienna in 1917, a world tour two years ago and last year a vacation spent in Africa.

Besides being a member of the Ramsey County Medical Society, Dr. Cook was also a member of the Minnesota Academy of Medicine and the Minnesota State Urological Society. He also belonged to the Town and Country Club, Somerset Golf Club, the Minnesota and University Clubs.

Dr. Cook is survived by two sisters, Mrs. Frank B. Kellogg and Mrs. Frank J. Ottis of Saint Paul, and a brother, George Cook of Rochester.

Henry F. Hoyt
(1854-1930)

Dr. Henry F. Hoyt, formerly a resident of Saint Paul but for the past twenty years living at Long Beach, California, died at Yokohama, Jan. 21, 1930, while en route from Manila.

Dr. Hoyt's long life of various activities has been depicted in his autobiography published last summer under the title "A Frontier Doctor," the introduction of which was written by former Secretary of State Frank B. Kellogg.

Dr. Hoyt's parents came to Saint Paul in 1848 and settled on a farm near Snelling and Larpenteur Avenues. Here the doctor was born Jan. 30, 1854.

At the age of eighteen Dr. Hoyt accompanied the expedition that established the boundary line between the United States and Canada from Glyndon, Minnesota, to Pembina, North Dakota. Returning to Saint Paul a year later he took up the study of medicine in the office of Dr. J. H. Murphy and in 1875 was placed in charge of the Church Hospital, now St. Luke's. He later entered Rush Medical College, where he received his degree.

Upon graduation Dr. Hoyt began practice in Deadwood, South Dakota. According to his own story undertakers were more needed there than doctors so he journeyed to the Texas Panhandle country on the strength of a report that an epidemic of smallpox was raging there. For the next twenty years he was, in turn, doctor, cowboy, miner, vigilante and doctor again. In Texas he became well known as a sprinter and boxer. From 1893 to 1898 he was chief surgeon for the Great Northern railway.

When the Spanish-American war broke out Dr. Hoyt entered the service and eventually became the ranking Army surgeon in the Philippines under General Frederick D. Grant. In this capacity he was in twenty-five engagements and at Marilao, Luzon, received two flesh wounds but stayed on duty. For this he was cited for bravery twenty-five years later.

Retiring to Saint Paul after the war, Dr. Hoyt became city health commissioner. Last fall, he and a sister, Mrs. George Wilson, of Minneapolis, sailed for the Philippines in order to spend Christmas with a sister, Mrs. George Harvey, of Manila. On board the ship Dr. Hoyt had the unique experience of hearing a review of his own book, "A Frontier Doctor," broadcast by radio from San Francisco.

Besides his sisters, Dr. Hoyt is survived by one son, John Terrell Hoyt, and a stepson, Owen H. Gray.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of January 8, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 8, 1930. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the Vice-president, Dr. J. S. Gilfillan, of St. Paul. There were 32 members present.

Minutes of the December meeting were read and approved.

The Secretary read a letter from Dr. Gustav Schwyzer of Minneapolis, resigning as President of the Academy. A motion was carried that Dr. Schwyzer's resignation be accepted and the Academy proceed to ballot for another president. Dr. Emil Geist, Minneapolis, was unanimously elected President for the year 1930.

Dr. Arnold Schwyzer (St. Paul) reported the following case* of Endothelioma of the Pleura removed by operation. Specimen was shown.

This morning we had an unusual operation on a young man, 23 years old, who had noticed a persistent pain in the right side of his chest for two years. *X*-rays made several times during the last year showed a tumor originally the size of a large plum gradually growing larger, apparently in the periphery of the lung. A bulging was noticed in November and biopsy showed endothelioma. First we resected a rib above and one below the bulging area, that is, about 12 cm. of the sixth and eight ribs. It was done under moderate over-pressure. The tumor was adherent to the diaphragm. This area of the diaphragm was excised, and a tight closure of the wound was made. This evening, 8 hours after the operation, the patient is reported doing well.

Neither Sauerbruch nor Lilienthal reports an operation for endothelioma of the pleura in their books on surgery of the chest.

(Addendum: Recovery was very smooth. The patient was out of bed four days after the operation and left the hospital one week after operation, feeling well.)

DISCUSSION

Dr. E. T. Bell (Minneapolis): This is a most unusual tumor and we have never had anything like it in our experience in the laboratory. The biopsy shows it pretty clearly to be an endothelioma. It is a cystic circumscribed tumor attached to the pleura over the ribs. The operation was much simpler than had been anticipated. It is the only case on record, I think, of an endothelioma that has been operated upon successfully. I am inclined to think it will be cured because it does not seem to involve any surrounding tissues.

Dr. J. S. Gilfillan (St. Paul): About 25 years ago I had a case come to me with a tumor just over the heart. We did not have *x*-ray then and we did not have available any pressure apparatus. At first I thought that in order to prevent the collapse of the lung I might pass large needles with sutures and get at the lung and hold it, but I did not do that. I opened the chest and found the tumor had involved the left lung. I excised four ribs with the tumor and lifted the lobe of the lung out and excised about one-half of the lung. I rotated the remaining portion of the lung and sewed it around the opening and closed the opening. There was apparently no shock from the operation and the patient felt fine the next day. That was an endothelioma; it was wider and flatter than Dr. Schwyzer's. About a year later I saw the patient, and at that time he had metastases in the vertebræ.

Dr. Herbert Jones (Minneapolis): About two years ago I had a man come to see me complaining of pain in his right shoulder. I went over him for possible trouble in the cervical nerves, a lung condition, or aneurysm, and they seemed to be all negative. I could not make a diagnosis. He did not seem to be getting any results and left me and went to one of the clinics and they *x*-rayed him and found a pleural effusion. They tapped him, and after that his pain was much worse. He then went to an osteopath and later came back to me, this last fall. He died October 30, 1929. When he returned to me he presented the appearance of a large tumor of the chest, but he was in such bad shape that I did not do anything but try and keep him comfortable. He had had one son die of Hodgkin's disease, and a daughter has tuberculosis. I will read parts of the pathological report from the University of Minnesota:

"The right diaphragm is very firm and rigid. The left pleural cavity contains 200 c.c. of straw-colored fluid. The right cavity is obliterated by firm white tumor tissue except for two pockets of straw-colored fluid of about 200 c.c. each, which are located posteriorly. The pericardial sac contains about 20 c.c. of slightly cloudy fluid. The right side of the sac is injected and roughened from extension of the tumor tissue. The right lung is firmly adherent to the chest wall, the diaphragm and the mediastinum by a firm white growth of tumor tissue up to 3.5 cm. in thickness. This growth has gone through the right diaphragm and is adherent to the liver. The nodes of the bronchi are normal to inspection.

"The spleen weighs 90 grams. The diaphragmatic surface of the spleen is firmly adherent to the diaphragm by a small firm white growth 3 cm. across. On section there are many small healed miliary tubercles.

"The liver weighs 1,100 grams. It shows moderate evidence of chronic passive congestion and is firmly adherent to the diaphragm by firm white tumor tissue. The gallbladder contains two small stones.

"Diagnosis: Endothelioma of the pleura with extension to liver, pericardium, lung, diaphragm and spleen."

I was absolutely unable to make a diagnosis in that case, and no opportunity for biopsy presented itself as in Dr. Schwyzer's case. Although I have had autopsies of a large per cent of my cases, I have never before had a case of endothelioma of the pleura and do not see how I could diagnose another.

*Case to be published in full at later date.

Dr. Hilding Berglund (Minneapolis): A moment's consideration of the diagnosis might be worth while. Could the diagnosis have been made a year ago? I believe not. A circumscribed endothelioma of this configuration is such a rarity that the possibility would certainly not be considered without biopsy. The mass was too well circumscribed and rounded to fit in with a carcinoma of the lung of the solid block type. The picture could just as well have indicated a cyst or an encapsulated empyema. I believe a needle was inserted in the mass about a year ago and about 10 c.c. of clear fluid, not further described, were obtained. With nothing but these facts to go by, I do not believe any very aggressive action was indicated at that time. Now the diagnosis was made possible only through the bulging of the tumor between the ribs and the result of the biopsy was a surprise. It is gratifying to think that the patient was no worse off today than he would have been if it had been possible to decide about an operation a year ago.

One diagnostic procedure, which often proves of value in cases of this type, should be mentioned: a pneumothorax performed before an operation. With the collapse of the lung new possibilities offer themselves for *x*-ray differentiation between intra- and extrapulmonary tumors. Adhesions in one direction or other likewise present themselves. Jacobaeus and Key used to be very fond of this procedure before operation, but of course it is not always necessary.

Dr. Schwyzer (St. Paul): If we had made a preliminary diagnostic pneumothorax we would have had the lung fall away entirely from the growth and we could then have gone in with more assurance of success. However, even if otherwise, it would not have changed our decision to explore; and as a part was adherent to the diaphragm by soft friable neoplastic tissue, it would probably have been torn off and given a chance for dissemination in the pleura.

Dr. Gilfillan's case is the only one that I have heard of that was operated on. I looked through several books rather hurriedly this afternoon and could not find a case.

I forgot to mention the fact that a year ago there was some fluid taken away from this growth.

The sensible thing to do, after the wound is healed, will be raying the area. We shall probably use radium, very strongly filtered so that the skin will not be damaged. I have a case in the hospital now who, a year ago, had had a little over 7,000 mg. hours in one session after an operation of an acousticus tumor in the cerebellopontine angle. No hair fell out after that application. She is in the hospital again now and getting this time 6,000 mg. hours.

Dr. Zimmermann (St. Paul): I would like to ask Dr. Schwyzer how he could do this without positive pressure?

Dr. Schwyzer: We used positive pressure. It was done in the simplest way. The patient was getting oxygen all the time through tubes put into the nose, with about 20 cm. water pressure. The patient did not have his mouth closed; there was just a little extra oxygen and a little extra pressure. I could have steadied the mediastinum by getting hold of the lung with a probang or we could have increased the oxygen pressure and ballooned the lung, but it was not necessary, and thus we had good room to work in with the lung almost collapsed. With the spinal anesthesia the patient was breathing very quietly. If there had been any difficulty I could have had more pressure by holding the patient's mouth closed or by increasing the pressure, or both. If the tumor had been adherent to the lung, and knowing it had a clear outline into the lung, I could very readily have divided the lung tissue between clamps and sewed it after the resection. I would have done just what Dr. Gilfillan did in his case where he had such a fine surgical result.

Dr. C. Naumann McCloud (St. Paul), retiring President, then read his Presidential Address entitled "Essential Hypertension," and asked for discussion from the members.

Dr. McCloud: Before presenting my paper, I wish to thank the Society for the honor shown me in electing me President of the Academy, where I have served during the past 15 months. It has been a very enjoyable year, and I particularly want to thank the members of the Executive Committee; they have been of very great help to me in conducting the proceedings of the organization, and in revising and putting in force the new Constitution. May I also state that our past Secretary, Dr. Carl Drake, has rendered a great deal of assistance to me, and I am sure that with the new efficient Secretary and the incoming officers, we should have a very profitable year before us.

I am very much interested in the subject of medical selection in connection with life insurance, and as the subject of hypertension has been causing us a great deal of perplexity, I thought this subject might be presented to the Academy tonight. In looking up the literature I was surprised to find how little there was published on the subject, and, though the President's address is not usually open for discussion, as there are several authorities on the subject of blood pressure here this evening, I would be very glad to have my paper discussed.

DISCUSSION

Dr. H. T. Nippert (St. Paul): I would like to ask the Doctor about the normal diastolic pressure according to different ages; for instance, what is considered the normal diastolic pressure between 20 and 30 years and between 30 and 40, and so on.

Dr. McCloud: Speaking generally for life insurance companies, it would fluctuate, but it would vary 8 to 12 points above the average.

Dr. E. L. Gardner (Minneapolis): Dr. Bell's statistics on autopsied cases may place the percentage of cardiac deaths in hypertension rather high. In my experience, relatives object to postmortem examinations where the head is to be examined, and this may make the number of cerebral cases which are autopsied relatively much lower than those of cardiac failure.

Dr. McCloud: This is the experience of all medical directors, that they look upon the cause of death with a good deal of misgiving in a good many of these cases. For instance, just yesterday a man died a sud-

den death and the attending physician gave the cause of death as "edema of the lungs." From all symptoms it was coronary thrombosis, and the autopsy confirmed this diagnosis.

I would like very much to have Dr. Bell, for he can so beautifully do it, discuss the subject brought up by Dr. Gardner.

Dr. E. T. Bell (Minneapolis): I am very much interested in Dr. McCloud's paper. The diastolic pressure has not been given as much attention as it deserves. I have not made much use of it in my studies because there seemed to be so much variation and irregularity that it could not be trusted in establishing the diagnosis of hypertension. If we use these two pressures we will find three groups: (1) A big group in which both the systolic and diastolic are elevated; (2) Cases in which the systolic is above normal and the diastolic is normal, and (3) A group in which the systolic is normal and the diastolic above normal. There are cases of hypertension with a normal diastolic pressure. The prognostic significance of the diastolic pressure must be determined from the experience of insurance companies. It will be a number of years before we have this information. Strange to say, there are not many statistical studies of very significant figures on the prognostic significance of high systolic pressure. Fischer found no increased mortality in accepted risks with systolic pressures of 140 to 750 mm. Hg.; but the death rate is much above the expected mortality with pressures above 150 mm. Hg. I have always considered a systolic pressure above 150, on repeated examinations, as hypertension.

Dr. Wetherby reported recently that in Dispensary patients over half above 50 years of age had a systolic pressure above 150 mm. Hg. Dr. Major found about the same proportion in the Ancker Hospital and Dispensary. Major found a systolic pressure above 150 mm. Hg. in about 40 per cent of the visitors above 50 years of age at the Ancker Hospital.

We are no longer sure what constitutes hypertension in the older age groups. Life insurance statistics deal largely with selected groups under 50 years of age. One of the first things we must find out is the normal pressure of the older groups. We have gone on the supposition that anything above 150 is hypertension. In about 12,000 postmortems which we have performed, 15 per cent of those over 50 years of age died from hypertension.

We have little or no knowledge as to the cause of primary hypertension. We have a lot of cases called secondary hypertension, practically all of which are secondary to kidney disease. That is the reason why Theodor Fahr is so strong on the kidney as the basis of hypertension. A fulminating primary hypertension is probably renal in origin; but in the great majority of hypertension cases there is not preliminary kidney disease but some unknown disturbance which keeps up a constant spasm of the arterioles of the body. Some 80 per cent of the arteriolar system is not involved. In the early cases of hypertension you can relax that spasm with nitrites. There is much evidence that the main thing is spasm, but what is the cause of that spasm? The only known factor in primary hypertension is inheritance. If it is inherited there must be some sort of physiological basis for it. Ninety per cent of the cases of hypertension appear after the age of 40 years. Hypertension is rare in young people.

Dr. J. F. Fulton (St. Paul): Fundus changes constitute a very important factor in the clinical findings of hypertension so satisfactorily described by Dr. McCloud in his very valuable paper this evening. Asthenopia associated with come-and-go vision, together with highly congested disc and retina, is frequently an early symptom. High blood pressure and retinal arteriosclerosis frequently exist independently of each other. There are those who claim that fundus changes are met with in less than 50 per cent of the cases of hypertension; on the other hand, there are others who maintain that circulatory retinal changes are always found in persistent high hypertension if they are carefully investigated, commencing with spasm of the smaller vessels, resulting in narrowing of the arteries, kinking of the veins, engorgement and tortuosity, commencing twisting of the smaller arteries either between disc and maculæ or more frequently in the periphery, associated with the formation of small white spots in the retinal structure increasing in number as the condition lasts. Retinal hemorrhages demand careful study. The large flame-shaped hemorrhages taking place in the fibrous layers of the retina associated with edema are indicative of serious kidney pathology, while the small round punctate hemorrhages situated in the deeper retinal structures are met with and without hypertension. There is no relationship, however, between the height of blood pressure and the degree of arteriosclerosis. The white streak frequently seen along the course of the vessel is indicative of lymphatic complications.

I wish to call attention to the recently constructed self-illuminated ophthalmoscope as being of great value in detecting early changes in the arterioles in the retina.

Dr. R. T. LaVake (Minneapolis): I would like to ask Dr. Bell about the early cases, those in young people. What does he mean when he says that he doesn't believe there is very much hypertension in the very young? How young? I have had several cases sent to me by men thinking that the patient had a toxemia of pregnancy, and I thought so too until I had followed them carefully for a considerable time. One was a girl of 20. She had a blood pressure of 160. On her father's side they all had hypertension. She never showed any kidney trouble so far as I could find, and she showed no nitrogen retention. She went all through pregnancy without any change in blood pressure.

Dr. Bell: I had reference particularly to the college age. Hypertension is rare in college students. We had one case that began at 5 years of age; but I do not believe that it often begins in early life.

Dr. LaVake: Another interesting feature was that this patient moved away and came back ten years later, and went through another pregnancy. The pressure had not varied in ten years.

Dr. McCloud (in closing): I would like to rise to the defense of the insurance statistics and our "be-

loved" examiners. In the 707,000 cases that were studied, those cases were not examined by "ordinary practitioners," but by experienced men, many of whom were medical referees and medical directors who spend nearly all of their time doing nothing but that sort of thing. However, that number constituted just a small portion of the number of cases examined; these were merely selected cases by that group of examiners. There were only 7,000 in that group that were ratable cases.

I wish to thank the members very much for their discussion of this paper.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
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THE PHYSIOLOGICAL MECHANISM OF PNEUMOTHORAX: F. Dumarest (Revue de La Tuberculose, 1929, X177). According to Forlanini the primary cause of the progressive nature of ulcerative pulmonary tuberculosis is the respiratory traumatism which is exerted upon a tissue that has lost its capacity to expand. Dumarest's former assistant, Parodi, has recently published a book on Pneumothorax which is concerned with the relations of the respiratory mechanism to the technic of the procedure.

As regards normal physiology, Parodi considers the movements of the thorax dependent on the elasticity of the lung: first, the structural elasticity of retraction, due to elastic fibres in the lung, which is effective during expiration; and, secondly, the functional elasticity which distends the lung during inspiration, brought about by the enlargement of the thorax and which represents the capacity of the lung for change in form.

It is easier to immobilize the apex of the lung than the base, and infiltrated rather than healthy areas because their capacity for retraction is increased while their power of distention is lessened. The various parts of the lung are independent of each other and this makes selective collapse possible. It is difficult to collapse healthy lung tissue. In such tissue there may even be reversed pressure due to interference with expiration by closed bronchioles and by muscular bands. In order that healthy lung tissue be collapsed, the air in the alveoli must be absorbed or expelled. Gradual relaxation of the muscle fibres increases the degree of possible collapse.

In the child, collapse can be brought about more easily as the elasticity of retraction is much greater than that of distention.

The diaphragm is an index of the elasticity of the lung structure. When there is infiltration, the diaphragm ascends; when the elasticity of the lung is diminished, as in emphysema, the diaphragm descends.

The rôle of the mediastinum is no less important. In the dog the mediastinum is very movable and a complete collapse of the lung cannot be secured without causing serious cardiac and vascular difficulties.

In the tuberculous patient the mediastinum is usually more fixed than in a healthy person, and an immediate complete collapse becomes possible. The degree of mediastinal fixation is therefore always important, but less so in bilateral pneumothorax.

When a pneumothorax is started, the amount and the rapidity of penetration of the gas under atmospheric pressure gives valuable information as to the state of retraction and the capacity for distention of the lung.

The rapidity with which the gas is taken and the amount of collapse secured are dependent upon the degree and nature of the lesions and of the lung tissue, whether more or less emphysematous. Neutralization of the tendency to expand is dependent on the state of the muscles and the power to inspire.

To produce a selective collapse it is necessary to introduce only that amount of gas which will neutralize the structural elasticity in the diseased area without seeking to reduce the functional elasticity of expansion in the healthy part of the lung. This can be brought about only when negative pressure is used in giving the pneumothorax.

Parodi has devised an apparatus called an "ergomanometer" which permits a closer analysis of the factors concerned in collapse than does the ordinary manometer.

A. T. Laird, M.D.

INDICATIONS FOR THORACOPLASTY: Karl Fischell (Amer. Rev. of Tuber., 1928, XVIII, 552/4). The more extensive the lesion on the compressed side, the smaller is the amount of normal lung tissue that will be affected by the operation and the better will the functional deficit be compensated by the increased activity of the better side.

Acute cases with short duration are not suitable for rib resection before a tendency to retraction is demonstrated. Operation is contraindicated in the stage of defense and should be attempted when the stage of re-

pair is reached when the heart and lung have had time to adapt themselves to diminution of the breathing space and are ready for increased compensatory function and, above all, retraction in different parts of the chest, thickening of the pleura, displacement and fixation of the thoracic viscera have developed, which indicate the necessary tendency to fibrosis which can be intensified by thoracoplasty.

Thoracoplasty acts on the chest wall, phrenicotomy immobilizes the floor. We know of no means to make the mediastinum resistant unless it is fixed by adhesions. If it is not fixed, paradoxical breathing or mediastinal flutter occurs.

Fever, cough, dyspnea and rapid pulse and palpitation are usually observed during the first week, the combined effect of shock, pulmonary and cardiac embarrassment and increased absorption of toxins.

The cardio-pulmonary reaction will be milder if the compression is done in two or three stages.

Other contributory factors to the postoperative reaction are sputum retention, aspiration pneumonia, and toxic crises. The latter resembles a true tuberculin reaction and will be mild or absent in chronic cases.

The risks of operation are greater if performed at too early a period. The case must be mature, as a cataract must be before it is removed.

In exudative lesions compression is not advisable or possible.

Marked constitutional symptoms such as high fever, dyspnea, cyanosis, and rapid pulse represent a formal contraindication.

The general condition of the patient must be taken into account. He must have a well functioning heart, and meet the requirements of a good surgical risk as to blood pressure, hemoglobin, red and white count and coagulation time. Contraindications on account of the better side must be stricter than in pneumothorax. It is wise to test the adaptability of the other side by phrenicotomy first.

Classical contraindications are extensive tuberculosis in other organs, extreme youth or age and cardiac and renal disease and diabetes. The author considers involvement of the larynx or of the intestines a contraindication. Myocarditis and valvular lesion of the heart and contraindications.

A. T. Laird, M.D.

INFRACLAVICULAR FOCI OF INFILTRATION AS EVIDENCE OF INCIPIENT TUBERCULOSIS OF THE LUNGS IN YOUNG ADULTS: Prof. Dr. H. Assmann (Radiology, XIV, Feb. 1930, 93). The author describes an isolated, rounded focus of varying density, usually situated just below the clavicle, in the lateral part of the pulmonic field which he considers to be a characteristic type of pulmonary lesion in the early stage of tuberculosis, particularly in young adults. He first described this lesion in 1922 and again in 1924. The apices are uninvolved in this type of tuberculosis. The position of this focus at a distance below the surface presents few or no physical signs, and the general clinical signs are also often minimal.

The anatomic basis is assumed to be the beginning tuberculous pneumonic infiltration, *i.e.*, an exudative process which often leads to caseation and central necrosis and thus to cavity formation which is well demonstrated on the *x*-ray plate. The author does not consider this a primary focus of infection since that usually occurs in childhood and is generally overcome, but rather a re-infection in an aërogenic manner.

The prognosis is generally favorable under proper treatment and the shadow of the focus may disappear, leaving only a very small linear scar.

Jacob Sagel, M.D.

ROENTGENOLOGY

SUPERVISORS

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RADIOLOGY OF THE THORAX: Samuel Brown, M.D. (Rad., Dec., 1929, XIII, 515). The author feels that antero-posterior and lateral views of the chest are superior to stereoscopic plates except in early tuberculosis. There is a constant relationship between the size of the heart and the thorax and this is expressed in a formula developed by the author. The *x*-ray anatomy of the thorax is well described. A knowledge of the exact position and relationship of the intrathoracic structures in the antero-posterior and lateral views is of great value in recognizing abnormal changes affecting any of the structures. The points discussed are well illustrated by twenty-four plates taken in the antero-posterior and lateral views.

Jacob Sagel, M.D.

THE ROENTGENOLOGIC MANIFESTATIONS OF INTRACRANIAL DISEASE: John D. Camp, M.D. (Rad., Dec., 1929, XIII, 484). In this type of work, stereoscopic plates in the lateral view, antero-posterior, and postero-anterior plates should be taken. Frequently, additional views of special structures are necessary. In order of their importance the various roentgenologic signs of intracranial diseases may be grouped as follows: (1) calcification within the lesion itself, (2) localized changes in the bone such as destruction, proliferation, or both, (3) changes in the sella turcica, (4) changes in the bone resulting from increased intracranial pressure, (5) displacement of the pineal shadow, (6) air in or about the lesion, (7) increased vascularity of bone.

Calcification within the lesion occurs in only a small percentage of cases. The usual change in the

bones overlying a contiguous tumor is a localized thinning due to pressure. The lesions producing deformities of the sella turcica are: (1) intrasellar tumors involving the pituitary gland, (2) suprasellar lesions, (3) disease of the sphenoid bone. Displacement of the shadow of the pineal gland is a very important sign in diagnosis. Increased vascularity of bone must be interpreted cautiously due to marked variations in the prominence of the diploë and other vascular markings. This sign by itself is not worth much. The article is well illustrated and a large bibliography is appended

Jacob Sagel, M.D.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
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EARLY RHEUMATIC INFECTIONS IN CHILDHOOD: C. C. McLean, M.D., Birmingham, Ala. (Arch. of Ped., November, Vol. XLVI, No. 11). Early rheumatic infection of childhood is characterized by an insidious onset. Many children complain of slight pains in the legs, feet or joints. They begin to drop objects and have difficulty in writing. Examination will show an anemic child who is nervous, excitable, high strung and underweight. Often no murmur is heard, but the heart action is rapid, with the apex impulse exaggerated.

When a diagnosis of rheumatic infection is made it is not always given the importance that it deserves. Feer states that 80 or 90 per cent of all cases of rheumatic infection will have a certain degree of heart involvement.

The most common symptoms are: (1) Poor appetite and failure to gain weight; (2) nervousness, irritability and fatigue; (3) repeated attacks of tonsillitis and nasopharyngeal infection with temperature; (4) pain in legs, joints, or stiffness of limbs. Seventy-one per cent have soft blowing systolic murmurs, the second heart sound being accentuated in each case. There were 103, or 87.3 per cent, underweight for their height.

Every child with manifestations of an early rheumatic infection should be given the benefit of the doubt and managed accordingly. The foci of infection should be found and removed when possible. Rest in bed and forced feeding is very important in this type of case. They are given a six-meal diet, with special emphasis on liver, spinach, prunes, whole wheat breads and cereals. They are also given iron and cod liver oil.

Every child with manifestations of an early rheumatic infection is a potential cardiac patient, and should be managed accordingly.

R. N. Andrews, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

General Medicine. Edited by George H. Weaver, M.D., et al. 829 pages. Illus. Cloth, $3.00. Chicago: The Year Book Publishers, 1929.

Comment Rajeunir. Dr. H. Jaworski. Albin Michel, Editor. 250 pages. Paper, 12 francs. Paris: Albin Michel, 22, Rue Huyghens, 1930.

Getting Well and Staying Well. Dr. John Potts. 221 pages. Cloth, $2.00. St. Louis: The C. V. Mosby Company.

Symptoms of Visceral Disease. Dr. Francis Marion Pottenger. 426 pages. Illus. Cloth, $7.50. St. Louis: The C. V. Mosby Company.

OUTLINE OF PREVENTIVE MEDICINE. Prepared under the auspices of the Committee on Public Health Relations, New York Academy of Medicine. Editorial committee: Frederic E. Sondern, Charles Gordon Heyd and E. H. L. Corwin. 398 pages. Price, $5.00. New York: Paul B. Hoeber, 1929.

This is an interesting and instructive book. Preventive medicine is a field that each practitioner should know and practice, and this book covers every field of medicine. There are twenty-one chapters, each chapter by a different author. The ground is well covered in a brief and interesting way and offers to the specialist an opportunity of covering the newest in other fields in a short period of time. It is a book worth reading.

A. N. Bessesen, Jr., M.D.

TULAREMIA. Walter M. Simpson, M.S., M.D., F.A.C.P. 162 pages. Illus. Cloth, $5.00. New York: Paul B. Hoeber, 1929.

This book is an extremely interesting presentation of a disease discovered and developed entirely by our own men. The printing is large and easy to read, 136 pages. It is fully illustrated and a large bibliography gives credit to each worker in the field. This book is not only interesting but instructive, and should be read by every American physician because of its inspiration. It promises a delightful evening at home and one the wife will enjoy as well, for it reads like a novel.

Alfred N. Bessesen, Jr., M.D.

THE TREATMENT OF FRACTURES. Lorenz Böhler, Vienna. 185 pages, 234 illustrations. Cloth, $5.00. Authorized English translation by M. E. Steinberg.

Dr. Böhler has written an excellent book, covering the entire field of fractures. After carefully reading this book, it is the opinion of the reader that Dr. Böhler has given us many new ideas, which may somewhat revolutionize our treatment of fractures. It is a pronounced departure from the usual orthodox fracture treatment. While the author stresses non-operative treatment, his methods really are more radical than our present operative treatment. Dr. Bohler has had the fortunate experience of treating many hundreds of fractures in Austria, under conditions which are not available in this country. Undoubtedly his methods are excellent in the hands of well trained men, with good hospital facilities, and a surgical team of six or eight people to carry out his method of treatment.

He emphasizes the use of local anesthesia, and interfragmental anesthesia almost universally. He favors the non-padded cast, recommends large amount of equipment, and goes into minute detail as to all the requisites necessary for treatment. He emphasizes immediate, forcible reduction, and uses skeletal traction in most all of his fractures. He introduces several new splints, both for bed treatment and ambulatory treatment. He has outlined his principles very clearly, but many of his methods are peculiar to his clinic alone. He has emphasized function very thoroughly, and this alone is a great contribution. Some of his operative methods, especially those for the treatment of pseudoarthrosis, are obsolete.

I believe this book is a definite contribution to the treatment of fractures, and I would recommend it to all men who have had training and experience in fracture work, but it is certainly a book to be kept out of the hands of people who rarely treat fractures, and who might become enthusiastic about these methods.

E. A. Regnier, M.D.

PHYSICIAN WANTED—Young physician to do general practice and resident work in clinic operating sixty-bed hospital in South Dakota. Excellent opportunity for clinical experience and good permanent clinic affiliation. Moderate salary offered for first year with opportunity for permanent connection following. Address D-58, care Minnesota Medicine.

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MINNESOTA MEDICINE

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RELATIONSHIP BETWEEN CHILDHOOD AND ADULT TYPES OF TUBERCULOSIS

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Minneapolis

THE army of the tuberculous is recruited from those infected in childhood." This statement has been interpreted in several ways. Some believe that the initial infection is always contracted in childhood, lies dormant for a time, then overwhelms its host. They believe that after the first infection exogenous sources of tubercle bacilli play no part. The most modern interpretation is that tuberculous infection, whether it first occurs in infancy, childhood or adult life, prepares the way for the adult type of tuberculous disease. The first infection confers some immunity which results in an ability of the tissues to fix or hold bacilli subsequently gaining entrance to the body wherever they find lodgment. Thus instead of being swept off to the regional lymph nodes they remain for the most part in their place of lodgment where they multiply and produce disease. This brings us to the points of differentiation between the childhood and adult types of tuberculosis.

1. The childhood type often develops in children, but may also occur at any time in life in a person who has not previously been infected with tubercle bacilli. Therefore, the childhood type is a result of first infection. The adult type is usually seen in adults, but may appear in children. It is the result of reinfection.

2. The childhood type may be found in any part of the lung, whereas the adult type usually makes its first appearance in the region of the apex, most often just beneath the clavicle.

3. In the childhood type the hilum and tracheobronchial lymph nodes are very quickly involved, whereas in the adult type these nodes usually do not become involved.

4. In the childhood type both in the lung parenchyma and in the regional lymph nodes the lesions usually become caseous and later calcified. Cavitation is rare and there is only slight tendency towards fibrosis. Around the parenchymal lesion still later true bone may be deposited. In the adult type there is a strong tendency for the caseous lesions to become excavated and for fibrous tissue to appear.

But what is the relationship between the childhood and adult types of tuberculosis? Was Ranke correct when he likened tuberculosis to syphilis by speaking of primary, secondary and tertiary stages? He described the primary lesion as one resulting from first infection, and located in any part of the lung parenchyma; the secondary lesion as one developing from the primary, but located in the hilum lymph nodes, and the tertiary as one developing from the secondary but located in the lung parenchyma. Evidence has accrued to cast some doubt upon the correctness of Ranke's assumption. When tubercle bacilli first infect the lung (at any age of life) there is no immunity present and consequently the lung tissue does not have the ability to fix or hold tubercle bacilli in their place of lodgment. Therefore, many are carried to the regional lymph nodes, where they set up disease almost simultaneously with that in the lung parenchyma. The lesions resulting in the lung and hilum nodes from this first infection we now speak of as the childhood type of tuberculosis. The adult type may appear soon or years after the primary type

or it may never appear. When it does, however, its usual location is in the lung parenchyma at the level of or above a plane passed horizontally through the chest slightly below the clavicle. The remoteness of these lesions from those of the tion. Again, the initial lesion that established the partial immunity may have been elsewhere than in a lung. If this group could be added to those with demonstrable childhood tuberculosis a very high percentage of those with clinical adult type

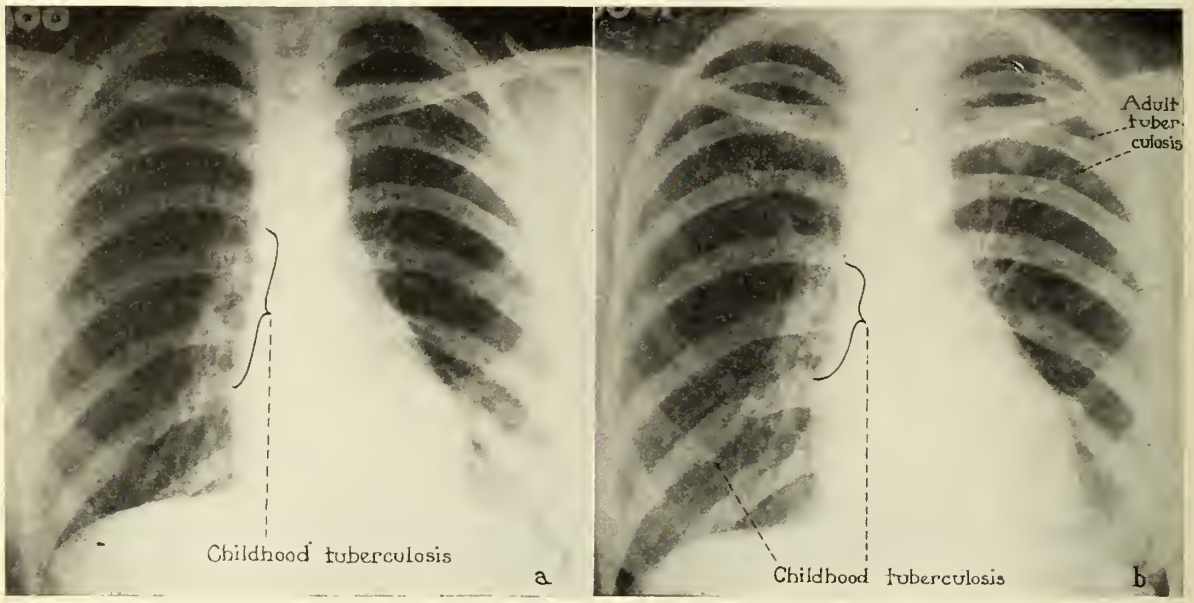


Fig. 1A. E. O., aged 17. Roentgenogram of the chest taken on April 14, 1927. Childhood tuberculosis right hilum. Cutaneous tuberculin test strongly positive. Exposed to sister who suffered from pulmonary tuberculosis and died in March, 1927.
Fig. 1B. E. O. Roentgenogram taken on December 29, 1927, of the same chest as seen in Fig. 1A. In addition to childhood tuberculosis in the region of the right hilum there is now adult tuberculosis in the apex of the left lung.

childhood type often being in the opposite lung again casts some doubt upon Ranke's assumption. The remoteness, together with the fact that in many cases that develop the adult type the exposure to tubercle bacilli through intimate contact has been continued or resumed, leads one to believe that a good percentage of cases of adult type tuberculosis are due to reinfection from exogenous sources.

In a recent study we found approximately 50 per cent of teen age girls and boys suffering from clinical adult type of tuberculosis also had definite evidence of the childhood type having existed as manifested by calcifications. The findings of Rathbun, McCain and McPhedran have been similar to ours. Therefore, it is obvious that the childhood type of tuberculosis easily demonstrated in the living precedes the adult type in approximately 50 per cent of cases. Obviously the childhood type can not always be demonstrated in the living as the calcifications may be obscured by the diaphragm, heart and other dense structures such as those composing the bony framework. Again, the lesions may be so small as to escape detection except on postmortem examination. Again, the initial lesion that established the partial immunity may have been elsewhere than in a lung. If this group could be added to those with demonstrable childhood tuberculosis a very high percentage of those with clinical adult type of disease would have been recruited from those ranks—perhaps a good many more than our

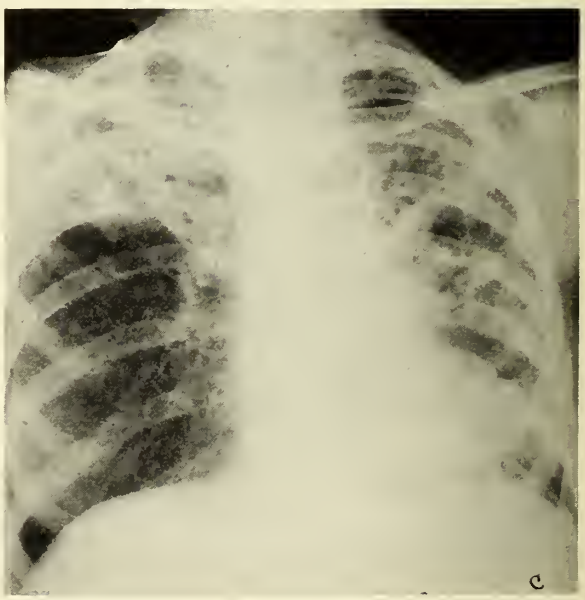


Fig. 1C. E. O. Roentgenogram taken on July 8, 1929, at the Glen Lake Sanatorium of the same chest as seen in Figs. 1A and 1B. In addition to the childhood tuberculosis in the region of the right hilum the entire left lung and the right lung to the level of the third rib are involved with adult type of tuberculosis. This patient died on August 15, 1929.

proved 50 per cent and Rathbun's estimated 75 per cent.

A second way of obtaining evidence is by watching children with the childhood type of disease over a period and actually observing the development of the adult type of disease (Figs. 1 and 2).

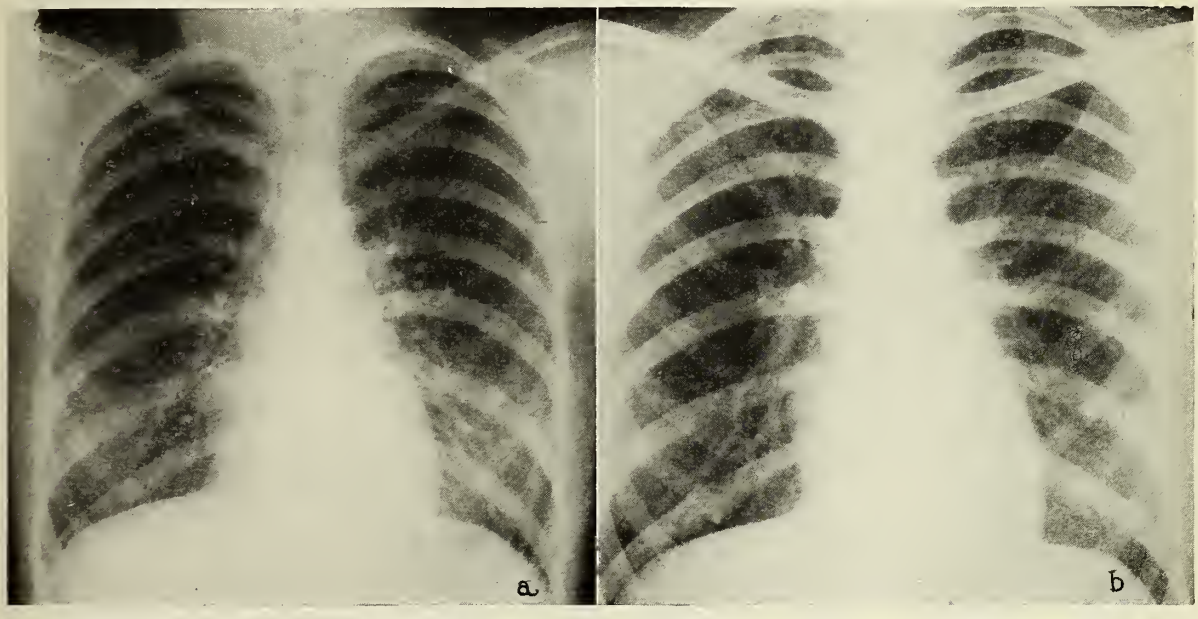


Fig. 2A. P. H., 14 years of age. Roentgenogram of the chest taken on February 16, 1926. Childhood tuberculosis right hilum. Father suffering from tuberculosis with a history of cough and expectoration since 1920. One sister died a year before this roentgenogram was made. Cutaneous tuberculin test strongly positive.

Fig. 2B. P. H. Roentgenogram of the same chest as seen in Fig. 2A, but taken on June 5, 1929. Childhood Type of tuberculosis right hilum, adult type with cavitation right upper lobe. Exposure to father has continued since roentgenogram illustrated in Fig. 2A was made.

The number of children at any age with the childhood type of tuberculosis is relatively small, but they contribute in a large way to the group in later life with the adult and killing type of tuberculosis. Therefore, such a definite relationship exists between these two types of tuberculosis that one of our great problems is to seek out the infants, children and young adults who have developed the childhood type and put forth every effort to help them avoid the development of the adult and fatal type of disease. Definite procedures to accomplish this have been tried and found effective.

That tuberculosis is a communicable disease is a well established fact. Galen once stated: "It is dangerous to live with consumptives and with those whose foul breath imparts a heavy odor to the rooms in which they lie." From the middle to the last of the eighteenth century, drastic isolation laws were enacted and enforced in Spain and Italy, so drastic, in fact, that great hardship was imposed upon not only the patients but also the physicians who neglected to report cases to the health authorities. These laws were based almost entirely upon personal opinion, for there was at that time no scientific proof that tuberculosis was contagious. One Italian physician said: "Pulmonary consumption is of such a malignant nature in our country that even after the death of the sick person there remains after him the seed of his malady hidden and unseen in many houses with serious danger to those who move into them thoughtlessly, and indeed some of this seed is so penetrating that it can be communicated even without immediate contact with the infected person or thing." One school was convinced of its contagious nature while another clung to the view that it is inherited. Since the foundation was purely a matter of personal opinion, the laws and their makers were severely criticized. As a result, many people joined the school believing in the hereditary nature of tuberculosis. Although it has been proved over and over that this school is wrong, the public today is still suffering from the influence of its teachings.

Klenke, Villemin, Cohnheim, Koch and many others have proved beyond doubt that tuberculosis is a contagious disease. The literature abounds with clinical observations and references to its contagiousness, particularly in infancy and childhood. The Brontë family, made famous by

the writings of Emily and Charlotte, was almost annihilated by this disease. All of the five children, but one, died from tuberculosis before the age of forty years. Any physician, even today, who has made a study of tuberculosis as it exists, has seen families with similar experience. Dr. L. M. Roberts of Little Falls, Minnesota, has cited the following: "The parents came from

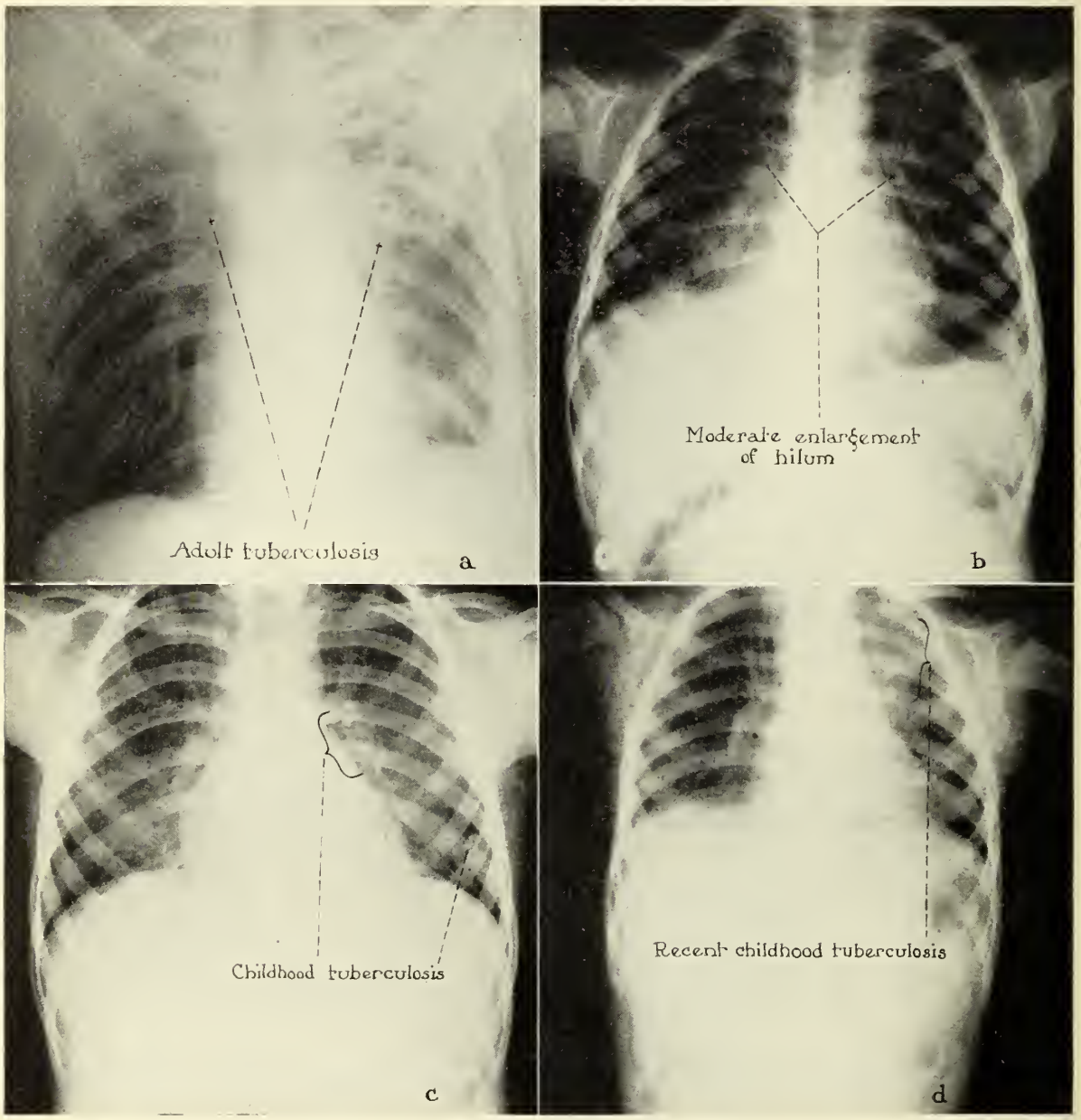


Fig. 3. Roentgenograms of four members of the same family. On April 10, 1929, the father was seen in his home. He had the appearance of one with advanced tuberculosis. It was learned that his disease was detected two years before, but in order to avoid the Health Department he moved to another city. There were three children in the home. The chest conditions of the father and the three children are seen in the illustrations as follows:

A: G. C. Father, aged 35. Roentgenogram taken in April, 1929. Advanced bilateral pulmonary tuberculosis, adult type. Recent hemorrhage. Quite ill.

B: D. C. Son. Two years of age. Roentgenogram taken on April 18, 1929. Moderate enlargement of the hilum on each side. The findings in the lungs are those usually seen in acute nontuberculous respiratory infection. Cutaneous tuberculin test strongly positive. At the time the roentgenogram was made this child had a temperature of 102°. A few days later he died of tuberculous meningitis.

C: G. C. Son. Three years of age. Roentgenogram taken on April 18, 1929. Childhood type of tuberculosis represented by primary focus in left base and calcification in left hilum. Cutaneous tuberculin test strongly positive. Apparently in good health.

D: B. C. Daughter. Age approximately one year. Roentgenogram taken on April 18, 1929. Childhood tuberculosis in the inflammatory stage, left upper lobe. Tuberculin test strongly positive. Child's general health is reasonably good.

the old country, where I am sure the mother contracted tuberculosis of the lungs. She gave birth to nine children, quite close together; one by one they died of tuberculosis, mostly very young. Only one or two passed their teens, the last to go was about twenty-six—then the father died, later the mother herslf." Lampson, Slater and Richdorf and Hetzler have called attention to the spread of tuberculous infection from one member of a family to others. In some instances as many as 100 per cent of the members of families have become infected. Over and over again, Krause has called attention to the great dangers of exposure to tuberculosis. In a scholarly work on the contagiousness of tuberculosis, Opie and McPhedran both descriptively and graphically have shown that not only tuberculous infection but also tuberculous disease is communicable.

The following cases show how tuberculous infection and disease resulting from exposure to any tuberculous member of the family may cause illness and death among other members of the family.

One case is that of a man of thirty-one years, who first reported for an examination in January, 1924. Recently his infant died from meningitis, which the physician found was tuberculous. The father was sure that his trouble was only bronchitis, although the history indicated that he had not been well for at least a year. The examination revealed advanced tuberculosis with tubercle bacilli in the sputum. After all the evidence was in, he was easily convinced of the truth and immediately gave up his work and in five weeks he was admitted to a sanatorium. He was extremely homesick, and decided to return to his home to continue treatment. Before his return home, a third child was born. A few weeks later this infant died of tuberculous meningitis. Not long after, the father died of the same disease. We have recently seen the wife and the oldest and only remaining child in the family, and although neither have any evidence of clinical tuberculosis, both react positively to tuberculin.

When tuberculosis has been detected in a family it is of great importance that good coöperation of the patient and the family be secured. In some places laws exist which, when enforced, compel the isolation of the patient. If the physician will devote time and thought to his cases and manifest much interest in them, he will in the majority of instances be able to inspire enough confidence so that all concerned are willing to coöperate with him. In the occasional family, however, it is difficult to obtain proper coöperation. Recently a mother brought three children for examination, each of whom had a marked reaction to tuberculin. A brief conversation with the mother convinced her that in all probability there is a case of tuberculosis among the children's associates. She consented to be examined and to have her husband examined, but in neither case could we find any evidence of pulmonary tuberculosis. Inquiry about other associates revealed the fact that a grandmother at one time had lymph nodes removed from her neck, and that she has coughed for years, but all attempts have failed to result in the slightest degree of coöperation from the grandmother.

A member of an orchestra had a profuse pulmonary hemorrhage while performing. When we saw him, he had extensive tuberculosis involving the greater part of the left and the upper lobe of the right lung. He stated that he had never been ill, but upon investigation we learned that two years before his case had been diagnosed in one of the free clinics in the city of Minneapolis and reported to the Health Department. The family disappeared, leaving no address, and their whereabouts was unknown to the Health authorities until the hemorrhage occurred. The examination revealed advanced tuberculosis (Fig. 3A). His mother, wife and three children were in the home, one of whom approximately two years old (Fig. 3B) had been rather drowsy for a day or so. The history of exposure and the symptoms led us to suspect tuberculous meningitis immediately. The child was sent to a hospital, where the findings were typical of tuberculous meningitis, and death resulted a few days later.

Another child of approximately three years was found to have a marked tuberculin reaction, and the examination revealed childhood tuberculosis with a primary focus in the lung parenchyma and calcification in the lung hilum on the same side (Fig. 3C). A third child of approximately one year had what appeared to be childhood tuberculosis in an active stage involving the upper lobe of the left lung (Fig. 3D). There was definite enlargement of the hilum. The mother showed a high degree of allergy, but no evidence of clinical tuberculosis. The grandmother was very thin and coughed, but refused examination. The father, who was without funds, was advised to enter an institution immediately, not only for his own sake, but for the sake of his associates, particularly his own family. He refused on the ground that he did not feel ill enough for any such treatment. We were finally able to convince him that the infant should be sent to a sanatorium. This was done, but after a few weeks in the institution the child developed pertussis. This appeared to be a rather serious complication with a recent parenchymal lesion, and after the pertussis had subsided, the *x*-ray showed extension of the disease to the entire left lung with pleural effusion on that side. The child looked ill, but recent films show considerable resolution of the parenchymal disease, and the infant's general condition is much improved. We feel that the prognosis in this case would be definitely improved if the exogenous infection could be stopped.

In March, 1924, a man of twenty-one years reported

for an examination of the chest, giving a history of having lost a sister from tuberculosis one year before. The source of her infection has not been determined. This young man was found to have moderately advanced tuberculosis and was sent to a sanatorium. He remained there for nine months and showed evidence of marked improvement, but at present his condition is critical. In December, 1925, a sister of eighteen years was brought home from college acutely ill. She had an extensive pulmonary tuberculosis, but later responded well to artificial pneumothorax. She is now working. In February, 1929, a brother of thirty-two years was examined, and found to have hopelessly advanced tuberculosis. He died in less than a year from the time his disease was detected. Of the entire family there is one sister who has remained free from tuberculosis. The source of the original infection in this family has not been determined. However, there are reasons to suspect that the father may be a chronic case of tuberculosis, although he has not submitted to examination. This and the previous cases show that sufficient cooperation to prevent the spread of infection and disease in families is often difficult to secure.

Almost every physician engaged in clinical tuberculosis work has seen a number of cases of *conjugal tuberculosis*. Galen said: "Besides there is a danger in being extremely intimate, especially in the conjugal relationship, with those who suffer from consumption." Villemin once remarked: "In the course of my practice, I have more than once been astonished to see wives begin to present the first symptoms of pulmonary phthisis in a short time after their husbands, with whom they had shared the bed up to the last moment, had succumbed to this disease."

Some authors have been inclined to believe that conjugal tuberculosis does not occur very frequently, but more recent accurate aids in diagnosis have shown that it is by no means uncommon. Arnould collected statistics on 53,069 families in each of which the wife or husband suffered from tuberculosis. In 8.43 per cent he found that both wife and husband were tuberculous. Opie and McPhedran made a study of this subject and found that in twenty-one families where tuberculosis existed in the husband or wife it also was present in the consort of ten families.

Tuberculosis may be considered in a large part as a *family disease*. Therefore, whenever a case is detected, all members of the family should be examined. When this procedure is generally practised, many cases of tuberculosis will be detected among children and adults earlier in the course of the disease than has been true in the past. Unfortunately tuberculosis may spread outside the family. In other words, so far as we know, there is no inheritance which makes only the members of the family susceptible. Other close associates are perhaps just as liable to become infected. It is also true that a person from outside the family may bring tuberculosis into the home. Over and over again we see tuberculosis developing in families who have always been free from it, and later trace the disease to a domestic who has been brought into the home. The frequent occurrence of such cases should convince us that every person being brought into our homes to live over a considerable period of time should be most carefully examined: first for tuberculous infection and second for tuberculous disease. Because of the greater prevalence of tuberculosis among Negroes and American Indians than among the white races one should be doubly sure that careful examination is made of members of these races before they are employed in homes.

Every case should be reported to the Health Department. It is a lamentable fact that the medical profession has not taken more pride in reporting tuberculous cases to health departments as required by law. The number first reported at the time of death is almost unbelievable. Investigation often reveals the fact that such cases have had diagnoses and have been spreaders of tubercle bacilli for months and even years. As health officer of Berkeley, California, in 1925, Dr. W. P. Shepard sent to the practitioners of medicine in Berkeley the following excellent reasons why they should report tuberculosis:

I. It is an infecious disease. It may become infectious at intervals for many years. The tuberculosis patient is notoriously fickle in his choice of medical attendance. He may remain a menace to the community for many years after numerous attending physicians have been discharged. He therefore belongs to a category with the typhoid and diphtheria carrier and becomes subject to regulation by law whenever his acts endanger the community.

II. The Health Department "stands by" in order to:

1. Assist the physician to obtain continued cooperation from his patient.
2. See that all physician's instructions to the patient are such that the community is given maximum protection.
3. Assist the physician to obtain institutional care for the patient when desired.

4. See that the patient at no time becomes a public menace whenever he is not under competent medical care.
5. See that the exposed members of the family are carefully examined and observed in the hope of detecting the secondary cases in their incipient and curable stage.

III. The Health Department in no way contemplates interference with private physicians, disturbing the patient's confidence in his physician, making any statement to the family not approved by the physician, divulging confidential matters relating to the patient, or, in fact, doing anything to which the physician who is well versed in all aspects of tuberculosis could possibly object. *Reportable cases* are those who by their clinical findings appear to be *active cases,* whether the sputum is negative or positive.

IV. Educating the public to regard tuberculosis as a community problem is a necessity. Such education can be done effectively by a public agency having reliable information on the morbidity and mortality trends in the community over a period of years. Such information can only be obtained by coöperation between physicians and the Health Department.

V. This campaign by public agencies coöperating with private physicians to teach early recognition of tuberculosis, the proper means of preventing infection, the value of sanatorium care, the importance of hygienic living has resulted in the greatest medical triumph of this generation; namely, the lowering of the tuberculosis death rate by more than one-half.

BICHLORIDOL

Bichloridol is a proprietary preparation of corrosive mercuric chloride suspended in a "palmitin" base, intended for intramuscular administration. It is sold in compressible ampules called collapsules. This preparation was formerly marketed by the H. A. Metz Laboratories, Inc., but is now marketed by the Duke Laboratories, Inc. In 1925 the Council on Pharmacy and Chemistry rejected Bichloridol because it was marketed with indefinite statements of composition and under a non-descriptive name. The A. M. A. Chemical Laboratory reports that it analyzed Bichloridol because of inquiries received, one inquirer writing, "One-half to one grain a week gives practically no reaction and likewise mighty little therapeutic effect." The Laboratory found the preparation to contain only from one-fifth to one-tenth of the mercuric chloride claimed. The Laboratory points out that a discrepancy of this magnitude is inexcusable and comments on the desirability of physicians confining their use of proprietary preparations to products accepted for New and Non-official Remedies. (Jour. A. M. A., December 21, 1929, p. 1971.)

TUCKER'S ASTHMA SPECIFIC

The continued exploitation of this cocaine mixture is a standing disgrace to the federal authorities. The nostrum carries a label admitting the presence of 5 grains of cocaine to the fluid ounce. When the Commissioner of Internal Revenue was asked in 1922 how such a product could be sent without violating the Harrison Narcotic Law, his reply was that the cocaine in the remedy became hydrolyzed before it reached the public, and that when used there was either no cocaine or a very small quantity. This commissioner, at the same time, also gave a fulsome puff for the nostrum, expressing the opinion that the mail-order distribution of this product served "a great humanitarian cause" and, for that reason, the Treasury Department was taking no action. This in spite of the fact that the product obviously violates the Harrison Narcotic Law, for if it does not actually contain cocaine it admittedly contains a derivative of cocaine, to which the law also applies. Furthermore, if the product does not contain 5 grains of cocaine to the ounce, then it violates the National Food and Drugs Act. (Jour. A. M. A., December 7, 1929, p. 1829.)

THE INCIDENCE OF TUBERCULOUS INFECTION IN SCHOOL CHILDREN*

Russell H. Frost, M.D.
Wabasha, Minnesota

IT is a well known fact that figures once quoted to show that the majority of children of school age have become infected with the tubercle bacillus are no longer accurate; or that while they may apply in certain of the large European and American cities they do not now, if they ever have in the past, reflect with any degree of precision conditions as they exist in the average American rural or semi-rural community. No attempt will be made in this brief report to review the extensive literature on this subject, since all of us are familiar in a general way with the work of von Pirquet,[1] Hamburger and Monti,[2] Barchetti,[3] and Peiser[4] in Europe, Ferguson,[5] Armstrong,[6] Chadwick,[7] and Myers[8] in North America, as well as a host of others who found, upon the application of various cutaneous tuberculin tests, incidences of infection among children ranging from 41 to 94 per cent. One cannot but come to the conclusion, after even a cursory review of the numerous articles on the subject, that the extent of tuberculous infection among children in the various countries and cities is dependent upon a number of factors, among which must be social and living conditions in general and the amount of open tuberculosis in the community; that the amount of such infection probably varies greatly among the different social levels in the same community; and that any conclusions based upon the findings in any single city or social class and which would appear to prove that tuberculous infection is practically universal among adults are erroneous.

Unfortunately, little investigation of this sort has been carried on in Minnesota outside of the larger cities. Slater (9) in 1924 published a report of 1654 Pirquet tests made on school children in rural Southwestern Minnesota, among whom he found only 10 per cent to react positively. More recently Mattill and Fenger (10) have reported a series of 3011 Pirquets on children in rural Hennepin County, Minnesota, with positive reactors averaging 10 per cent (and 23 per cent if the questionable positives were included), these figures including several of the sizeable urban centers immediately adjoining the city of Minneapolis where Myers and his associates at the Lymanhurst School have found the incidence of positive Pirquets among school children to range between 45 per cent and 50 per cent.

TABLE I

TABULATION OF RESULTS OF VON PIRQUET TESTS

Age	Male		Female		Total of All in Age Group	Positive	Negative	Per Cent Pos.
	Pos.	Neg.	Pos.	Neg.				
5 and under	0	7	1	8	16	1	15	6.2
6	3	23	0	12	38	3	35	8
7	2	14	4	21	41	6	35	14.6
8	3	12	3	13	31	6	25	19.3
9	4	21	4	22	51	8	43	15.7
10	4	14	8	16	42	12	30	28.5
11	6	14	4	11	35	10	25	28.6
12	8	8	3	20	39	11	28	28.2
13	8	11	8	12	39	16	23	41
14	3	16	7	17	43	10	33	23.2
15	6	10	5	23	44	11	33	25
16	2	13	3	9	27	5	22	18.5
17	2	5	6	14	27	8	19	30
18, 19 and 20	0	4	1	4	9	1	8	11.1
Total	51	172	57	202	482	108	374	22.4%

This report gives the findings in 482 children in the public and parochial schools of Wabasha, Minnesota, a community of approximately 2500 persons. During the past school year the work was initiated by sending to the parents of each child a questionnaire asking for information about such of the child's past illnesses as might have a bearing upon the present problem and about a history of possible or actual exposure to open cases of tuberculosis. A check of the answers thus obtained showed that about the only reliable information secured was the child's name and age. In so many proved instances parents refused to admit that there had been cases of open tuberculosis in their families or homes that any attempt to correlate incidence of tuberculous infection with history of exposure had to be abandoned. The 482 children examined consti-

*Read before the sixty-first annual meeting of the Wabasha County Medical Society, Wabasha, Minnesota, July 11, 1929.

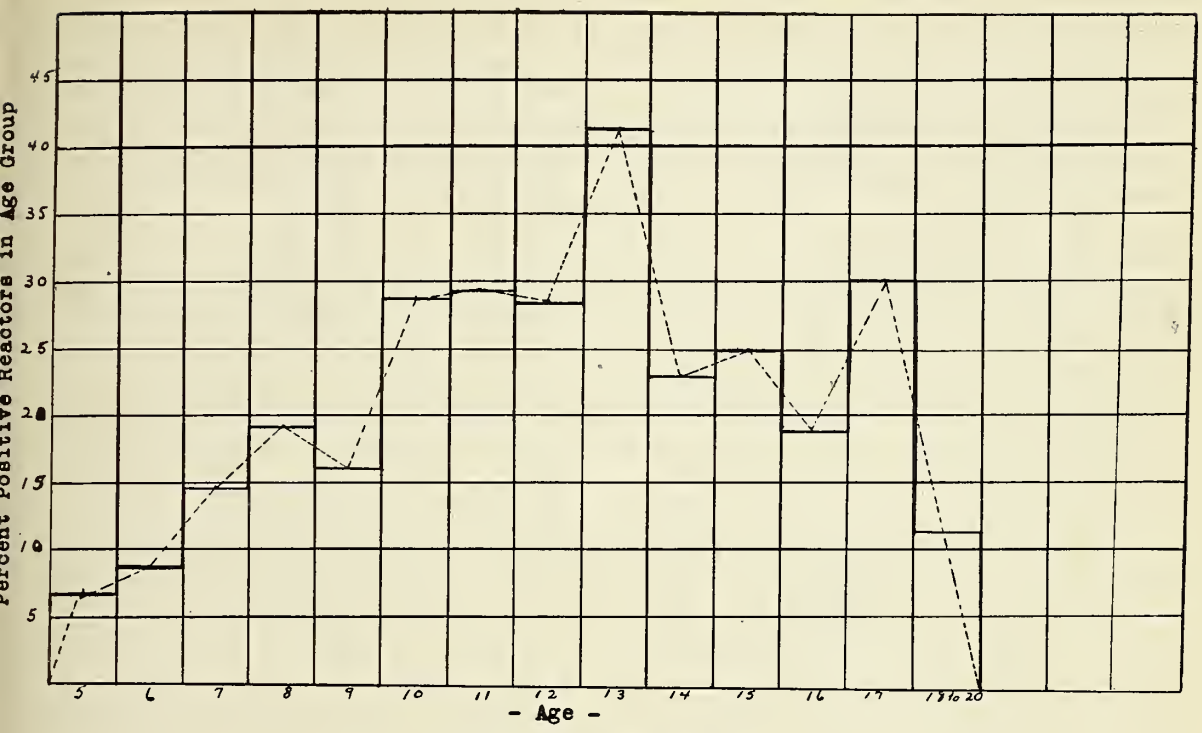


Fig. 1. Von Pirquet tests.

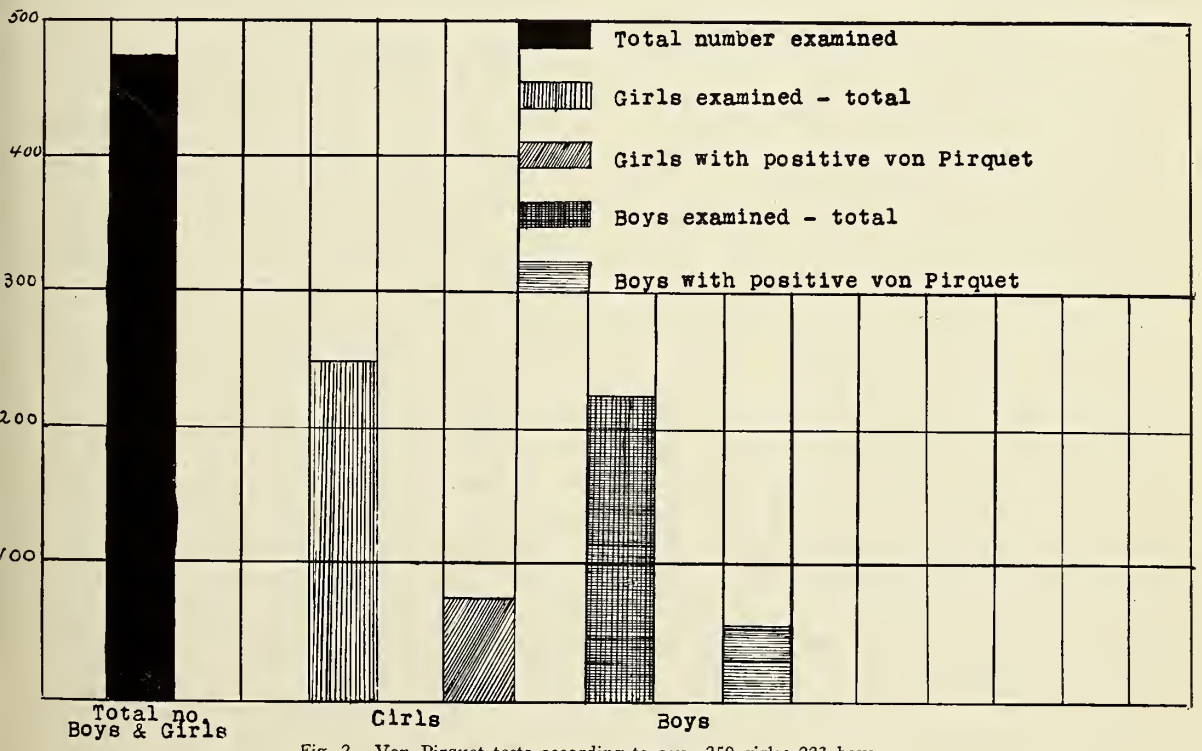


Fig. 2. Von Pirquet tests according to sex—259 girls; 223 boys

tuted approximately 80 per cent of the combined enrollment of the city's two school systems. A single von Pirquet test, read in forty-eight hours, was applied to each child, using the ordinary von Pirquet scarifier and full strength human O.T. of proved potency obtained from the Trudeau Laboratory at Saranac Lake, N. Y. I am aware that the results thus obtained can justifiably be criticized on the grounds that the von Pirquet at its best is only about 85 per cent accurate (11); that it would have been better to apply the graduated Mantoux or intracutaneous test with both human and bovine tuberculin; and that a certain small percentage of the negative reactors would have reacted positively had another von Pirquet been later applied. For various reasons, however, neither of these latter procedures was feasible, and it was felt that the results which were obtained and analyzed were sufficiently accurate for purposes of comparison with those obtained elsewhere, since in most other similar series approximately the same method of examination was employed. No effort was made to grade the positive reactions as mild, moderate or severe as is sometimes done; however, no reaction was regarded as positive unless there was at least a palpable red infiltration 5 mm. in diameter at the site of inoculation.

Of the 482 children examined, 223 were boys and 259 were girls. Their ages ranged from 5 to 20 years and the number of individuals in each age group was fairly uniform with the exception of the very youngest and very oldest. Of the total number 22.4 per cent reacted positively, these being remarkably uniformly distributed between boys and girls, 22.8 and 22 per cent respectively.

In common with many of the published reports of this nature and as will be seen in the table and shown graphically in the charts, the percentage of positive reactions rises fairly uniformly from 6+ in age group 5 to a peak of 41 per cent in age group 13, and then declines somewhat less consistently in the later age groups. Beyond the fact that one is unwarranted in making generalizations based upon a relatively small series of cases, with the errors inevitably attendant upon such an attempt, I can offer no explanation for this decline in the age groups from fourteen years on unless it be, as has often been suggested, that the skin hypersensitiveness to tuberculin in persons receiving a relatively slight infection very early in life tends to disappear as the primary tuberculous focus absorbs or calcifies with the passing of years or becomes more and more firmly invested with impenetrable layers of fibrous tissue.

It is hoped at a later time to incorporate with this preliminary report the findings after *x*-ray of the chests of the positive reactors in this group of children in order to determine the incidence of demonstrable roentgenographic evidence of primary pulmonary tuberculous infection, juvenile or hilum tuberculosis in the younger individuals, and adult type pulmonary tuberculous disease in those who are approaching maturity.

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Buena Vista Sanatorium.

THE TEACHINGS OF MEDICAL EXPERIENCE*

George Douglas Head, M.D.
Minneapolis

THIS talk is directed to the young men upon the benches before me. Those veteran practitioners who may listen will travel in their mind's eye over the trying situations in their years of past experiences. To them it will be a recital of the lessons learned out of the practice of the healing art.

Efforts made to guide the young practitioner in a safe course of conduct fail to take into account the fact that a large part of his work will consist in the care of functional ailments for which there is no known pathology. A lack of training in the art of medicine causes him to flounder about in a sea of uncertainties which in the early years prove to be very costly. If a few of these errors can be avoided some gain will result. I know you will pardon personal references to my own work which can not be well avoided in illustration of the points which I wish to emphasize.

We are not all moulded of a like personality. Some of us by nature have a large amount of patience, others are of more irritable temperament. Some of us radiate hope and good cheer, others are more serious or fail to inspire our patients with a sense of reassurance.

The young man of irritable temper must overcome it if he would succeed. Pain and sickness produce a profound effect upon the human organism. Bodily functions are altered, internal secretions modified, sleep disturbed. The sick man or woman is on edge nervously. Tranquility of spirit is a golden asset in the face of such a situation. If possessed by nature, the young doctor is fortunate indeed; if not, it must be acquired by rigid discipline. Knowledge of disease in all its varying aspects is important to know but does not by any means fit a man for practice. Sick people are self-centered and serious about their ailments. They rely completely upon their medical advisor. He must be a patient, resourceful man, able to meet the varying demands made for relief from fancied as well as organic ills. He must be able not only to intelligently prescribe drugs or other therapeutic measures but must give out of his own self that reassurance that comfort of mind required of all those engaged in the care of the sick.

One of the first lessons which a young man must learn is to avoid dogmatic statements relative to the prognosis of disease. Some patients apparently going down to death ultimately recover; others apparently affected with a mild sickness die unexpectedly. Many years ago when I first began the practice of medicine I had an experience which I shall never forget. A nurse about forty years of age was down with lobar pneumonia. She was in the hands of a very skillful man. A number of consultants had seen her. In a state of deep coma for days with high fever, deep cyanosis and no expectoration, a fatal prognosis was made. The friends and others were awaiting her death. To the surprise of us all she refused to die and after a fearful struggle recovered. It does not add to a man's professional reputation to make a fatal prognosis and have the patient survive.

Where the diagnosis is established or highly probable do not hesitate to express your opinion as to the outcome, always, however, with the qualifying statement that "experience is fallacious and judgment difficult." Many times in such a situation "Silence is golden." On the other hand, to say nothing to enquiring friends when the situation demands an opinion is a sign of lack of self-confidence and an evidence of weakness. Sometimes it is better to be wrong and be positive rather than to be right and say nothing. It is important to sense the situation.

When pressed for a diagnosis where a definite conclusion can not be arrived at, state that more time and study are required. Do not say you do not know. An older man whose reputation has been established in the community can admit his ignorance. Not so a young practitioner. A diagnosis is usually an opinion. It is rarely proven beyond some doubt. In an obscure case where a conclusion is difficult seek time for further investigation. The best rule of good prac-

*A Talk delivered before the Medical Alumni Association of the University of Minnesota.

tice is to investigate and again seek more evidence.

The course of certain diseases is very difficult to interpret. One of these is lobar pneumonia. It is very treacherous. I have learned never to give a positive opinion as to the outcome in a given case. Two personal experiences have taught this lesson. Some years ago while studying in Vienna, I was assigned to examine a young man propped up in bed, rather cyanotic, breathing with an effort and rapidly. A cursory examination revealed lobar pneumonia of the left upper lobe. His pulse was regular, he was rational and his heart sounds were good. Having finished the examination I sat down on the edge of the bed and started talking with a doctor examining a case next to mine. Suddenly I felt a sort of tremor in the bed and looking at my patient saw him with his head back, pupils dilated and an ashen gray color over his face. He was dying. So sudden had been his death that a sandwich which he had been eating was still in his fingers and some of the bread in his mouth. Examination of his heart five minutes prior to death gave no inkling of the fatal outcome. Not many years ago while on a consultation in South Dakota I examined a large robust man about fifty-five years of age with lobar pneumonia. He was a very sick man but his heart tones were of good quality and there was no irregularity. I saw no sign of approaching death. After finishing the clinical study I stepped out of the house, walked about half a block up the street when the nurse came running toward me saying, "come quick, Doctor, the man is dying." Sure enough, on my return, not five minutes after I had examined him and found no signs of a failing heart, he was dead.

If the patient has a fatal malady it is not good practice to tell the patient himself but make known his condition to some discreet member of his family. No more difficult situation arises in the sick room than to face day after day a conscious patient suffering with an incurable disease who is going to die and knows it himself. The atmosphere is intolerable. In the face of death, instill a fighting spirit in the patient and let him go down with his colors flying. Not long ago a man with an incurable abscess of the liver and thrombophlebitis lay dying. His wife came to me and said, "Now, Doctor, my husband is going to die. What is the use of all these measures of treatment which you doctors are carrying on. Why not let him die in peace." "Yes," I said, "we think he is going to die but he is perfectly rational and if we relax our efforts he will be quick to interpret that we have given up hope. Let us give him courage to face death," and we did. He went to the end fighting like the good soldier that he was.

On the other hand patients at death's door and unconscious of their fate have a right to die in peace. Futile attempts at keeping them alive by various forms of medication are not justified. Put the dying patient in the arms of Morpheus with a hypodermic of morphine and let him sleep out his existence. It relieves the patient of suffering and calms the relatives in the presence of death.

Do not be too anxious to state your opinion of the nature of a case unless pressed for your conclusion. Delay in stating a diagnosis often saves mistakes, the later course of the disease changing one's opinion. In every case acquire the habit of painstaking investigation. Gerhardt's words should not be forgotten, "Die frucht der Heilung wachts am Baume der Erkentniss. Ohne Diagnostik Keine vernünftige Therapie. Erst untersuchen dann urteilen dann helfen."

When all the clinical evidence points to a diagnosis which seems correct beyond doubt, but is reached by little investigation and an easy course of reasoning, be cautious about stating your conclusion too positively. Many apparently certain diagnoses prove at the operating or autopsy table to be wrong. As a rule the more carefully you have investigated all features of your case the more nearly correct will be your conclusions.

The signs of the certain approach of death are sometimes very difficult to interpret. It is a good rule to be very slow in making a dogmatic statement when faced with such a decision. Not long ago I had this experience. A very sick man with a chronic ailment was suddenly seized with what appeared to be an acute heart failure. He was unconscious, eyes turned back in his head, pupils widely dilated, face ashen gray color, whole body deeply cyanosed, no pulse at the wrist, heart sounds could not be detected with the stethoscope. To all appearances he was dying. The family was summoned to the bed side and informed of approaching death but the patient did not die. After some stimulation the heart began beating, the pulse returned, consciousness

was restored and he lived on for three weeks more, to the chagrin of his medical attendant and the disturbed mental state of his family.

I have learned not to ask for an autopsy in a fatal case, by telephone or proxy. If you want it badly make your request in person. You are the attending physician and friends will often grant a request from you which would be refused another.

Never talk to friends about an autopsy in an apparently fatal case prior to death. It makes a bad impression. Wait until the patient is gone; then ask for the postmortem examination.

Always secure an autopsy when it is possible. It is the best way to learn clinical medicine. A well performed postmortem always reveals valuable lessons not to be forgotten. One learns most by his mistakes. Some men prefer not to know them; not so the careful clinician.

In a difficult case court consultation. The family is reassured and often a new viewpoint is revealed and valuable therapeutic suggestions brought out. No man has experience enough or knowledge enough to know everything in medicine. The more experience one accumulates the more humble he becomes and the less he thinks he knows.

Where a difference of opinion occurs between the man in attendance on the case and the consultant, the attending clinician should weigh carefully the reasons for the consultant's opinion but should not necessarily follow the advice given if his own judgment dictates otherwise. The responsibility for the outcome of the case rests on the attending man's shoulders. Often times the medical attendant in close touch with the case who has followed its course from day to day has the better judgment. Not long ago in a severe heart case such a difference of opinion arose. The attending man demurred at the advice given by the consultant. However, he gave way to the consultant's supposedly better skill and experience. The result was disastrous to the patient.

The atmosphere of the sick room should always be hopeful. There is enough anxiety on the part of relatives without adding to it with a long face. On the other hand good judgment must be shown in not assuming too frivolous or joking an attitude in the face of a grave situation. In these situations good common sense should be shown.

In dealing with people harboring chronic ailments much resourcefulness must be called into play. The profession has been slow to teach its young men the best methods of procedure when dealing with such diseases. Altogether too much emphasis in medical instruction has been placed upon the management of acute diseases. A doctor should as a rule take the attitude of an advisor or counselor rather than a policeman or sheriff.

Sick men or women can be reasoned into a course of action but rarely forced or driven into it. Place some responsibility upon the patient himself. It is his body. If he does not heed your advice he is the one to suffer. Put to him in this light he will often acquiesce where otherwise he would rebel.

Attention to details in instructions to patients is very important. Here many men young and old fail. All bedside orders should be in writing. It is your protection, impresses the patient with their importance, tends to make instructions more specific and avoids confusion or misunderstanding on the part of nurses.

Carefully recorded notes upon the findings of your cases, not only the primary examination but also the subsequent visits should always be kept. Nothing impresses a patient more than a good record of his case kept on file and referred to whenever he consults you. No man has a sufficiently retentative memory to carry the details of complaints and findings. To ask patients from visit to visit for a recital of their aches and pains, medicine taken, etc., consumes time and impresses badly the sick man or woman.

Do not waste time in idle gossip in the sick room. So soon as you have finished your examination and written your orders leave the patient with some cheering word of hope and comfort.

I have seen a doctor enter a house and without any solicitous inquiry concerning his patient start a discussion relative to the model of his latest automobile or the coming football game. Your first consideration should always be the condition of the sick person. Has the patient had a good night? How high did the fever range? Was the pain better or worse? Your time is too valuable. You have too many other sick people to visit to bother about unimportant things in the presence of suffering and death.

Perfect your knowledge in the natural course of disease. Both operative and medical treat-

ment is overestimated. It is astonishing how well many sick people will get on if they are left alone and not fussed with too much. The old rule in rhetoric applies to therapeutics "Be not the first by which the new is tried nor yet the last to lay the old aside." It takes a long time to establish the value of a therapeutic procedure or a scientific truth. In our reasoning we as scientific men must not lose sight of the rules governing scientific evidence. Remember that many diseases are self-limited. Our zeal to treat disease functionally often leads us to lose sight of the known organic pathology of many ailments worked out over years or centuries of painstaking observation.

In the hope that some of you young men may profit thereby I have opened up the book of my experience and turned some of its leaves. Great progress has been made in the control and cure of disease in the third of a century just passed. It is a work of which all medical men can be justly proud. We must, however, sit humbly at the feet of the Goddess of our science when we remember our failures to conquer cancer in its various forms, tuberculosis, pneumonia, nephritis, rheumatic fever, scarlet fever, chorea, septicemia, erysipelas, influenza, whooping cough, measles, leukemia, and a host of other diseases which suffering humanity is called upon to face. These stand as a challenge to the present generation of physicians.

ZONITE DECLARED MISBRANDED

Zonite is another of the many hypochlorite preparations which arose from the work of Carrel and Dakin during the war. It has been advertised like a typical "patent medicine" under the firm name of the Zonite Products Co. The propaganda for Zonite is, in effect, capitalization on the work of Carrel, Dakin and others, and the method of exploitation has been that typical of the nostrum business. Chemically, Zonite, after dilution with equal parts of water, is claimed to be essentially the same as surgical solution of chlorinated soda. According to a recent notice of judgment, Zonite was declared misbranded in that certain statements were false and misleading. Zonite has been exploited to both the physician and the public. It goes without saying that it has not been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies. (Jour. A. M. A., December 7, 1929, p. 1830.)

THE HAZARD OF USING NONACCEPTED DRUGS

Recently the A. M. A. Chemical Laboratory published a report on Bichloridol collapsules indicating that only from one tenth to one fifth of the amount of mercuric chloride claimed to be present was actually discovered. The results of the A. M. A. Chemical Laboratory has received independent confirmation. Apparently most of the mercuric chloride had reacted with the lining of the collapsule and was not in the medicament itself. This product has been administered to patients by physicians who thought that they were giving a certain dosage of mercuric chloride, whereas the patient received only from one tenth to one fifth of the dose he should have had. In 1925, the Council on Pharmacy and Chemistry declared Bichloridol nonacceptable for New and Nonofficial Remedies. It is safer to follow the Council! (Jour. A. M. A., February 22, 1930, p. 563.)

THE USE OF BARBITURIC ACIDS, ACETYLENE, SPINAL ANESTHESIA, TRIBROMETHYL ALCOHOL AND OTHER ANESTHETICS IN THE MAYO CLINIC IN 1929*

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THIS is the fifth of a series of articles,[2, 3, 4, 6] dealing with results from the use of various anesthetic agents as they have been used in The Mayo Clinic through each of the five years.

The data presented in Tables 1 and 2 will be referred to briefly and in the same manner as those employed in 1927 and 1928. I would point out that Table 1 is arranged from a slightly different standpoint than that adopted in the arrangement of Table 2. In Table 1, the total of the percentages for the respective years is 100. The percentages in Table 2 total more than 100 for the reason that in some cases several agents, such as a local anesthetic, one of the barbituric acids, and inhalation anesthetics were used during a single operation. A single case, in Table 2, therefore, must be included under several headings.

TABLE 1

ALL AGENTS OR METHODS USED (EACH FIGURE IN THE TABLE REPRESENTS THE NUMBER OF INDIVIDUAL CASES FOR THE YEAR DIVIDED BY THE TOTAL NUMBER OF CASES FOR THE YEAR)

Agents	1929 Per cent	1928 Per cent
Local*	36.2	40.39
Local and ether	0.18	0.26
Local and gases†	8.0	9.96
Spinal‡	5.19	1.21
Ether (semi-open drop method)	15.2	16.75
Gases†	31.0	30.13
Ethyl chloride†	0.71	0.73
Oil-ether colonic	0.57	0.58
Acetylene	0.22	0.06
Barbituric acids	3.04	
Tribromethyl alcohol	0.06	

*Includes the local anesthetic used for extraction of teeth, thyroidectomy, tonsillectomy, hemorrhoidectomy, and so forth.
†With or without ether.
‡With or without general anesthesia.

LOCAL ANESTHESIA

The data show a decrease in the percentage of patients to whom local anesthetics were given. However, this decrease has been principally in the number of cases in which infiltration anesthesia has been accomplished by the surgeon or his assistant, mostly for minor surgical operations. There was also a slight decrease in the number of cases in which local and general anesthesia were intentionaly or necessarily combined. On the other hand, there was a considerable increase in the use of spinal anesthesia; it was used more than four times as frequently in 1929 as in 1928. This form of anesthesia was used by many surgeons rather than by a few. A factor contributing to the more extensive use of spinal anesthesia was its wide use in urologic cases for a period of six or seven months of the year. However, the conclusion was reached that it was not applicable as a routine measure and that henceforth it would be used only when indicated.

Spinal anesthesia continues to remain popular for preparing patients for operations for lesions of the large bowel. The majority of such patients is given this type of anesthetic unless there is a contraindication to its use; the principal contraindication is hypotension for frequently they are debilitated. The use of ephedrine, prior to the administration of spinal anesthesia, has been continued throughout the year with considerable satisfaction. I believe that ephedrine is valuable as a means of offsetting the fall in blood pressure which may accompany spinal anesthesia. Therefore, I feel that in the average patient with an average blood pressure, ephedrine sulphate,

TABLE 2

AGENTS OF SPECIAL INTEREST (PERCENTAGE OF CASES IN WHICH CERTAIN ANESTHETIC AGENTS OR METHODS WERE USED, BOTH ALONE AND IN COMBINATION WITH OTHERS)

Agent	1929 Per cent	1928 Per cent
Local	49.9	51.8
Ether	43.6	44.6
Ethylene	27.2	30.9
Nitrous oxide	34.0	27.9
Carbon dioxide*	39.4	32.5
Acetylene	0.22	0.06
Barbituric acids	3.04	
Tribromethyl alcohol	0.06	

*Used as a respiratory stimulant only.

*From the Section on Anesthesia, The Mayo Clinic, Rochester, Minnesota. Read before the Ramsey County Medical Society, St. Paul, Minnesota, February 5, 1930.

0.050 gm., should be given subcutaneously about ten or fifteen minutes prior to the administration of a moderate dose of procaine hydrochloride introduced subdurally. I believe that if the blood pressure is in the neighborhood of 100 mm. of mercury, systolic, the ephedrine should be given twenty minutes before the spinal injection is begun and that a spinal anesthetic should not be given unless there is some evidence that the patient can respond to a drug which will raise blood pressure. In patients with hypertension, when the blood pressure is 160 mm. or more, systolic, the hypodermic injection of ephedrine is delayed until the procaine has been placed subdurally, and the effect of the procaine is apparent (sensation of heat or of numbness in the feet). Obviously, the important factor, when a patient has hypertension, is to delay giving the ephedrine, with its effect of elevating the blood pressure, until it is certain that anesthesia can be produced with the procaine. There is always the possibility that one cannot make a proper subdural deposit of the procaine.

Toward the end of 1929 there was an increasing tendency toward the use of spinal anesthesia in certain operations in the upper part of the abdomen, especially operations on the gallbladder and its ducts. I had felt that untoward reactions were occurring less frequently in 1928 than previously and that the severity of these reactions had decreased, and I had hoped in 1929 to find some satisfactory means of increasing the duration of anesthesia without increasing the number and severity of untoward reactions. At present, I believe that one is not justified in using, in the average case, a larger dose of procaine than is considered to be a safe one after the various factors by which the dosage is determined have been taken into consideration. I consider, therefore, that in estimating the dose to be used, one should not often exceed a dose of 0.001 gm. of procaine for each pound of body weight, and should not exceed 0.150 to 0.30 gm. for any patient. I have seldom exceeded a dose of 0.20 gm. and then seldom have seen any special untoward result. Nevertheless, since all anesthetic agents have the power to destroy life as well as to produce anesthesia, I think it wiser to use a moderate dose of procaine, and, if necessary, to combine procaine with some other anesthetic agent (combined anesthesia). In debilitated or old patients, patients with hypotension, with heart disease, with recent extreme loss of weight or decreased respiratory surface or patients with several types of infection, even as much as the usual dose might be contraindicated. In such cases I feel that not more than 0.10 gm. of procaine will prove to be a safer dose. I believe that it is often especially valuable to give morphine sulphate, grain ¼ (0.016 gm.) subcutaneously and sodium *iso*-amylethyl barbituric acid, grains 6 to 9 (0.40 to 0.50 gm.) by mouth as preliminary medication. In this way it is possible to produce anesthesia with smaller doses of procaine administered subdurally than when less preliminary medication has been used.

Although I have frequently attempted to obtain ampules of procaine with some type of nonremovable indicator showing the number of milligrams of procaine contained in the ampule, I am told by manufacturers that this cannot be done. Therefore, in order to avoid error after the labels have been removed from the ampules during the process of sterilization, I have found it desirable to use an ampule holder. The ampule holder bears a mark which indicates the number of milligrams of procaine in the ampule. This eliminates the possibility of giving an overdose by using the wrong ampule (Fig. 1). On the tray the nurse places three holders which contain, respectively, one ampule containing 0.10 gm., one containing 0.120 gm. and one containing 0.150 gm. Moreover, the ampule may become slippery, and the holder prevents its being dropped.

A second point of importance in the application of spinal anesthesia, after the dose has been determined, is the technic to be followed in the administration of the anesthetic. The method employed in the last year has produced rather satisfactory results. I believe that it is a good technic for institutional use, and especially when one may wish to direct another in the administration of a spinal anesthetic. For example, a surgeon should be able to direct his assistants in the manner in which the anesthetic is to be given. He may even wish to give directions verbally or by letter. I feel that if an exact technic such as I shall describe could be followed by several groups, comparison could then be made at the termination of the year which would point out the important factors in obtaining spinal anesthesia without untoward reaction.

There are four important factors in the administration of a spinal anesthetic: 1. The site of injection may be (a) between the second and

third lumbar vertebræ for operations in the upper part of the abdomen; (b) between the third and fourth lumbar vertebræ for operations in the lower part of the abdomen; (c) between the fourth and fifth lumbar vertebræ for operations on the perineum and lower extremities. 2. I have already explained how I estimate the dose. 3. The amount of spinal fluid to be withdrawn

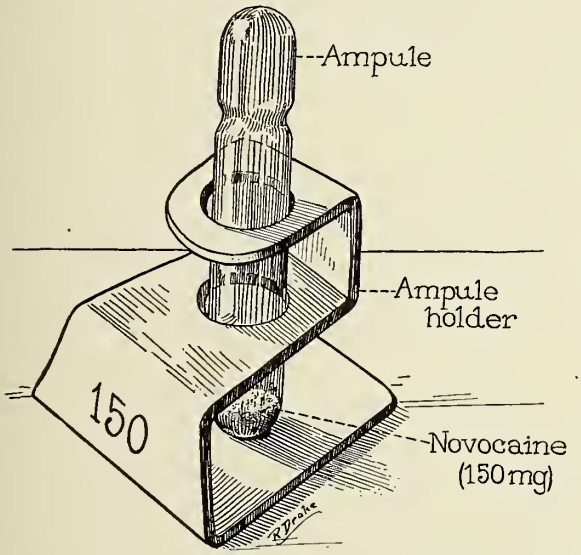


Fig. 1. Ampule holder holding ampule of procaine. The figure on the ampule holder indicates in milligrams the weight of procaine in the ampule.

and in which the crystals of procaine will be dissolved and then reintroduced will vary with different regions. I find that for most operations in the lower half of the abdomen, especially those in the urinary bladder or those in which penetration through the urinary bladder is necessary, withdrawal of about 3 c.c. of spinal fluid is sufficient. For operations on the colon withdrawal of 4 to 5 c.c. is satisfactory. For operations on the gallbladder and its ducts withdrawal of about 6 to 7 c.c. of fluid is sufficient. For operations on the stomach it is best to withdraw from 7 to 8 c.c. 4. The speed with which the fluid is to be injected is important. I believe that the most satisfactory results from procaine are obtained by injecting 1 c.c. of fluid every two seconds if the spinal fluid aspirates freely. In other words, injection of 4 c.c. of fluid will be accomplished in eight seconds.

From what has been said concerning dose and withdrawal of spinal fluid, the following facts can be deduced: 1. Exclusive of differences dependent on the intervertebral space that is used for injection, the level of the anesthetized space will be relatively high if a relatively large volume of spinal fluid is withdrawn, used as a solvent for the anesthetic drug and then reinjected; relatively low, if the volume of spinal fluid employed is relatively small. 2. For operations of average length, the dose will vary directly with the size and tolerance of the patient.

I am still very much impressed with the value of giving oxygen or a mixture of oxygen and carbon dioxide to patients in whom untoward reactions seem to be developing. It is decidedly advantageous in controlling nausea and vomiting regardless of whether or not untoward reaction is apparent. I consider that we have obtained satisfactory results from the use of spinal anesthesia. A detailed account of many of its uses has been prepared.[9, 10]

Combined anesthesia has been decreasing somewhat in popularity for the last four years. I believe this to be due to the interest which has been shown in the use of these new anesthetic agents. However, the probable ultimate outcome of the use of these new anesthetics will be a tendency to revive the popularity of combined anesthesia. These new agents will be used as part of the preliminary medication in preparing patients for operation. It seems that their most logical use is in balanced anesthesia.

ETHER (SEMI-OPEN DROP METHOD)

The usual annual decrease of about 1 per cent in the number of cases in which ether has been administered by the semi-open drop method, continues to be evident in the data for 1929. I believe that this decrease is due to the employment of new anesthetics, the use of which was begun in 1929. This small annual decrease will be especially interesting to those who had expected the use of ether by this method to be short-lived. There is, however, one outstanding drawback in the gradual abandonment of this method. Namely, if the popularity of this method decreases, anesthetists will become less skillful in its use and it is probably the safest method of producing anesthesia in the hands of the average anesthetist. At least, one often feels justified in using it when there might be a question con-

cerning the advisability of using other general anesthetic agents.

OIL-ETHER COLONIC ANESTHESIA

Oil-ether colonic anesthesia is now used only in obstetric cases and then only when it seems to be particularly indicated. It has been almost entirely replaced by the intratracheal method in surgical operations.

ETHYL CHLORIDE

Ethyl chloride, as an inhalation anesthetic, is used occasionally and almost entirely for induction to ether. Recent reports of its unsatisfactory use elsewhere has interfered with its popularity at the clinic. However, in my experience, satisfactory results have been obtained with it.

INTRATRACHEAL ANESTHESIA

From the standpoint of the anesthetist, intratracheal anesthesia is one of the most desirable methods. Personally, I am impressed with its advantages and hope to see it used more extensively in general surgery. In 1929, as well as during 1928, it was used almost entirely for operations on the head, neck or thorax.

During 1929 I used the two-catheter technic. The anesthetic vapor was insufflated through a small catheter and was exhaled through a larger catheter. The larger catheter was connected by a rubber hose to a rebreathing bag, and satisfactory anesthesia resulted in almost every case. In cases in which operation was to be done on the nose, and the operation permitted, catheters were passed through the mouth. When operation was to be done on the mouth or lower lip, the catheters were passed through the nose. In 1930 I hope in some cases to be able to utilize a single large catheter with an inflatable cuff by means of which the parts of the trachea about the catheter may be entirely closed off. This is desirable from the standpoint of excluding air from the anesthetic mixture and preventing aspiration of mucus.

CARBON DIOXIDE

Carbon dioxide continues to be a valuable asset, and the consensus of opinion of anesthetists at the clinic is that carbon dioxide should be available whenever an anesthetic is being administered. I also have found mixtures of carbon dioxide and oxygen to be of great benefit in attempting to control hiccough which had become persistent, both in surgical and in nonsurgical cases.

NITROUS OXIDE

Nitrous oxide continues its rather spectacular return to popularity. However, in many instances it is used only for induction, and at the termination of administration of ethylene. Nevertheless, I am finding that since carbon dioxide is available, ethylene is less necessary.

When intratracheal anesthesia is being used it is my custom to use nitrous oxide and oxygen as a vehicle for ether unless cautery or diathermy is being used in close proximity to the vapor, in which case ether is not used. Future changes in the popularity of nitrous oxide depend on the fear of explosion with ethylene. Should explosions of ethylene occur frequently throughout the country, or should one occur at the clinic, my associates and I probably would abandon its use and substitute nitrous oxide for it.

ETHYLENE

The use of ethylene has decreased about 3 per cent each year for the last three years. This is without doubt due to the frequent reports of explosions. Thus far, no explosions have occurred at the clinic, although it has been administered more than 37,000 times. Satisfactory results are obtained with it in the majority of instances, although in many cases it has been reënforced with ether so that anoxemia might be avoided.

ACETYLENE

The use of acetylene for thoracoplasty and less extensive operations on the thorax was begun in 1928. As I have stated before, it has been possible, with acetylene, to produce anesthesia and relaxation, with quiet breathing, without anoxemia and without the addition of ether. Acetylene was used more than three times as often in 1929 as in 1928; it was the anesthetic used as a routine for thoracoplasty and similar operations on the thorax. The results I have obtained in its use have been entirely satisfactory, except that the blood pressure is markedly elevated during the first twenty minutes of anesthesia. This elevation of blood pressure is almost a constant factor.[1] In anesthesia by acetylene I find it advantageous to give morphine shulphate and atropine sulphate subcutaneously prior to the administration of acetylene. There is said to be a greater possibility of explosion in the use of acet-

ylene than in the use of ethylene and I feel that if possible its use should be curtailed, if equally favorable results can be obtained in any other manner. At present, my associates and I plan to use it for thoracoplasty and other operations on the thorax in the presence of bronchiectasis. When bronchiectasis is absent, we may use morphine sulphate grain ¼ (0.016 gm.) subcutaneously, sodium *iso*-amylethyl barbituric acid 6 to 9 grains (0.40 to 0.60 gm.) by mouth, with ethylene or nitrous oxide and with mixtures of carbon dioxide and oxygen. We are still confronted with the difficulty of obtaining pure acetylene.

BARBITURIC ACIDS

The use of barbituric acids as hypnotics, antispasmodics, and anesthetics, has been rather extensive since April 1, 1929. Statistical data and reports of individual cases concerning our experience with these agents appear elsewhere.[5, 7]

Personally, I feel that barbituric acids serve us best when used to reënforce preliminary medication, with the idea of reducing the amount of inhalation anesthetic which will then be required in order to produce anesthesia, relaxation, and quiet respiration without anoxemia. We have used chloretone by mouth, morphine sulphate subcutaneously, and sodium *iso*-amylethyl barbituric acid intravenously and by mouth in preparing patients for operation. This combination has been very satisfactory from more than one point of view. Fear, excitement and the amount of anesthetic necessary are reduced. Frequently the nervous patient is quieted sufficiently so that a local anesthetic alone is all that is necessary. Because of the antispasmodic properties of *iso*-amylethyl barbituric acid, it protects the patient against the most toxic effects of a local anesthetic; namely, convulsions of the respiratory musculature and the resulting anoxemia. In 1929, it was used by mouth in more than 500 cases with satisfactory results. I have given it by rectum in capsules of 3 grains (0.20 gm.) to children and adults when oral and intravenous methods were contraindicated or exceedingly difficult to follow. Capsules given by rectum have been very satisfactory, especially in children. Unless the dose of the barbituric acid is 9 grains (0.60 gm.) or less, I prefer to give the drug intravenously.

In 1929, sodium *iso*-amylethyl barbituric acid was administered more than 600 times and almost standard technic has been adopted in its intravenous administration which is as follows:

A dose of sodium salt of *iso*-amylethyl barbituric acid is dissolved in sterile distilled water to make a 10 or 20 per cent solution and is aspirated into a 10 c.c. syringe. A very sharp needle is attached, and intravenous puncture is made. The drug is then injected, in the average case, at the rate of about 2 c.c. for each minute for the first 4 c.c. It is always injected much more slowly in old and debilitated patients, especially in the presence of hypotension. Readings of blood pressure are taken each minute during the administration of the drug. If the blood pressure is normal at the beginning, and then falls to a level of 85 or 90 mm., systolic, and remains low, the injection is discontinued and the needle is withdrawn.

As the anesthetic solution is being injected, the patient is asked questions. When he can no longer respond it is considered that the full hypnotic dose has been given, but even then little, if any, anesthesia has been produced. If, for any reason, it is desirable that anesthesia be produced with the barbituric acid alone, the injection is continued, and the degree of anesthesia is ascertained by grasping the skin with a skin forcep; if there is no response to this stimulus, traction on the skin with the forceps is added. If there is still no response to the stimulus, anesthesia is considered to be established. Then it remains only to decide how long it is desired that the anesthesia should last. If the operation is to be long, and it is desirable that the patient have prolonged sleep after the operation, the injection is continued until 4 to 6 grains (0.24 to 0.40 gm.) more of the drug have been given. Throughout the injection the depth of respiration must be constantly observed. If it becomes shallow, or stops at any time, the injection must also be stopped immediately and no further injection made until the respiration becomes reëtablished. An early untoward effect on respiration is almost always directly due to administration of the drug at an unduly rapid rate. In estimating the amount of the drug to be used in controlling nonsurgical patients who are excited or have some spasmodic disorder I expect to see some effect of the barbituric acid over as many hours as there were grains used. As the effect of the drug is wearing off, some patients will sleep, whereas others have simply a feeling of weariness.

In the average patient it can be expected that anesthesia will be maintained for twenty to forty minutes when a dose of 15 to 23 grains (1 to 1.5 gm.) has been used, provided the patient has been given a preliminary dose of chloretone grains 10 (0.65 gm.), by mouth, and morphine sulphate, grain 1/4 (0.016 gm.) with atropine sulphate grain 1/150 (0.0004 gm.) subcutaneously. In the majority of instances I have used sodium *iso*-amylethyl barbituric acid but I also have used sodium ethyl*iso*butyl barbituric acid in a few cases.

In reviewing the literature on the barbituric acids I find their outstanding disadvantages to be as follows: (1) postoperative pulmonary edema, and (2) excitement, which appears frequently and is very annoying unless some method of restraint is applied. On the other hand, patients to whom the drug has been given are so enthusiastic concerning it that a genuine effort should be made to use it in preparing patients for operation.

TRIBROMETHYL ALCOHOL

The new general anesthetic, tribromethyl alcohol (avertin or E-107) administered usually by rectum has been recommended very highly. Therefore I used it in a few cases in 1929. I was careful to give no more than 100 mg. for each kilogram of body weight and have prepared patients preoperatively with chloretone grains 10 (0.65 gm.) by mouth, morphine sulphate grains 1/4 (0.016 gm.), with atropine sulphate grain 1/150 (0.0004 gm.) subcutaneously. It was my intention to produce only basic anesthesia and to combine it with anesthesia by inhalation. Occasionally no other anesthetic was necessary and results were satisfactory. There have been reports of intestinal irritation resulting from the rectal use of tribromethyl alcohol and I was particularly concerned about a few cases in which patients complained of tender anus and rectum for a few days after operation. Proctoscopic examination, however, revealed no pathologic condition and each patient made an uneventful recovery. However, I believe my associates and I are not likely to use this drug in aqueous solution. If we use it at all, it will probably be in a solution of gum acacia and then only as a basic anesthetic.

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ADENOMATOUS POLYPS OF THE COLON AND RECTUM*

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THE term adult, acquired polyp was first applied in 1925 to a certain class of pedunculated neoplasms found in the large bowel. Erdmann and Morris used this term as a clinical differentiation from the so-called multiple polyposis which is now accepted as a definite entity. The word polyp has a purely morphological application with no relation to histological characteristics. A polyp is merely any new-growth with a pedicle, and may be an adenoma, fibroma, lipoma, myoma, or angioma, and may be benign or malignant. There have been various attempts at clinical or pathological classifications of polyps, but they have been rather unsatisfactory. Lockhart-Mummery classifies the adenomata of the bowel as: (1) True multiple adenomata; (2) multiple polyps associated with old strictures of the colon; (3) polyps associated with hyperplastic tuberculosis; (4) polypoid condition resulting from ulcerative colitis.

The relation of polyps to mucous membrane irritation in the colon has long been well known. Single or scattered polyps, sometimes quite obviously the result of irritation, at other times with no discoverable etiological lesion, sometimes quiescent and discovered accidentally, at other times producing violent symptoms necessitating immediate attention, constitute the group called by Erdmann and Morris the adult, acquired type. It was suggested in a former paper that the term "adult" be discarded, using only the word "acquired," since the former carries the implication that this type of tumor is confined to adults and is not found in children. Adenomatous polyps make up by far the largest group of intestinal growths and are frequently seen in children.

In the second type of polyposis we find the mucosa of the bowel the seat of hundreds or thousands of small polypi (Fig. 1). Luschka estimated the number in his patient at 10,000. This form usually makes itself evident in childhood or early youth, rarely has a discoverable associated etiologic lesion, has a distinct familial tendency, and a milgnancy incidence of from 40 to 50 per cent. This form is the true multiple, adolescent, congenital polyposis, and is the only type to which the term multiple polyposis should be applied. A bowel may contain scattered and even fairly numerous polypi, and they may still



Fig. 1. Resected colon showing multiple polyposis.

be merely multiple polyps, and not a true multiple polyposis.

In a collection of 46,879 cases of rectal diseases of all types there were 554 instances of benign tumors. Dewis in 1904 collected from the literature 219 cases of benign tumors of the intestinal tract, all of which were submitted to careful microscopic examination. Leichenstern listed 128 intestinal polypi. Of the total 347 cases in the two series 243 were in the rectum and colon, and 202 were adenomata. The various histological types were distributed as follows:

TABLE 1

	Angio.	Fibro.	Myo.	Adeno.	Lipo.	Total
Colon	0	1	8	46	12	67
Rectum	2	2	10	156	6	176
	2	3	18	202	18	243

The following table from Erdmann and Morris illustrates the predilection of adenomatous tumors for the rectum and colon.

TABLE 2

	Small gut	Large gut	Rectum
Adenoma	11%	25.2%	63.8%
All other forms	48%	27.1%	24.8%

*From the Department of Proctology, Miller Clinic, Saint Paul. Thesis presented before the Minnesota Academy of Medicine, Dec. 11, 1929.

In a study of Yeomans complete table of the 347 cases of Dewis and Leichenstern we find 75 per cent of all benign tumors of the intestinal tract were adenomata. Of all the benign growths in the intestinal tract 45.9 per cent, and of the adenomata 63 per cent are found in the rectum, hence well within reach of the examining finger. The moral is obvious.



Fig. 2. Benign adenomatous polyp. Low magnification. Columnar epithelium and large clear glands which are normal in appearance.



Fig. 3. High magnification of specimen shown in Fig. 2.

Age.—As has been said, true multiple polyposis is a disease of childhood and early youth; the acquired polyp one of any age. In 127 cases of multiple polyposis collected in a former paper, the ages were as follows:

TABLE 3

Under 10 years	5
10 to 20 years	23
20 to 30 years	21
30 to 40 years	23
40 to 50 years	11
50 to 60 years	4
60 to 70 years	5
70 to 80 years	1

Of the cases in the above series 65.6 per cent were between the ages of 15 and 35 years. It is of additional significance that of the cases in the series in which the ages were given, over one half had had symptoms for over ten years, so that the age in the series is actually lower than is shown.

Of acquired polyps one writer says "Clinically adenomata occur most frequently in children from 3 to 10 years of age, though they are not unusual in adults." David, writing in Lewis' Surgery states that adenoma of the rectum is frequently found in children from two to five years of age, but is also often observed in adults. In our own series of 25 single polyps the ages ran from three to seventy-one years, distributed as shown in the following table.

TABLE 4

Under 10 years	4
10 to 20 years	0
20 to 30 years	1
30 to 40 years	2
40 to 50 years	3
50 to 60 years	10
60 to 70 years	4
70 to 80 years	1

Our oldest patient was seventy-one years of age, and in the literature are case reports of single adenomas in children of only a few months.

Site.—As has been said 63 per cent of adenomata of the intestinal tract are located in the rectum. These single polypoid tumors may be situated just inside the anal canal, in the ampulla of the rectum, at the recto-sigmoid angle, or in the sigmoid itself. Palpable pedunculated tumors immediately inside the anal orifice are more likely to prove to be hypertrophied anal papillæ or hemorrhoids which have been the seat of inflammatory change. When adenomata develop in this area they sooner or later develop a pedicle of such length that they may protrude from the anus during defecation. A favorite location for

the development of adenomata is the anterior wall of the rectum, proximal to a sharp fold marking the junction of the rectum and sigmoid. In this region a small tumor may escape notice unless the fold is depressed to allow one to see behind it. Carcinoma of the rectum also is often seen in this site, and may quite probably be the result of earlier polyp formation.

Characteristics.—The adenomatous polyp is not in a true sense an adenoma, but merely a polyp covered with more or less normal mucosa. Macroscopically it is bright red, glistening, fairly smooth, but sometimes lobulated like a mulberry, and varies in size from 1 to 2 centimeters in diameter to that of a walnut. Goodsall reports one the size of an orange, and Esmarch one weighing four pounds. It bleeds very easily, and thus has as one of the earliest symptoms the passage of bright blood in the stool. The pedicle may be extremely short and thick, or it may be several inches long, and so slender as to tear off with the slightest traction, liberating the tumor and permitting it to be passed with the stool. Prideaux saw a tumor with a pedicle six inches in length. Microscopically it is seen to spring from the mucosa of the intestine and have a connective tissue stalk covered with glandular epithelium showing a hyperplasia. The stalk usually shows a leukocytic infiltration with the formation of new stroma cells, blood, and lymph vessels. Ewing describes the formation of adenomatous polyps as "inflammatory adenoid hyperplasia."

Malignancy.—In considering the possibility of malignant change in adenomatous tumors of the bowel it is perhaps advisable to regard them as two separate groups, the single or scattered polyps, and the congenital, multiple polyposis. In 36.4 per cent of the collected 127 cases of multiple polyposis there was a known and proven malignancy. Since it was known that an additional thirty-one patients died rather early of cachexia, inanition, or bleeding, it is reasonable to assume that the malignancy index was somewhat higher than the 36.4 per cent that the statistics showed. In Doering's and Soper's series the percentage of malignancy was 43 per cent. Mummery states that almost all recorded cases of multiple polyposis of the colon eventually become malignant.

In the case of the single polyp the question of malignancy is not so easily disposed of owing to the fact that these tumors are usually promptly removed as soon as diagnosed, thus ending once and for all the chance of becoming malignant. In the true multiple type there is ample opportunity to study the changes that take place, and often to observe and study microscopically the transi-

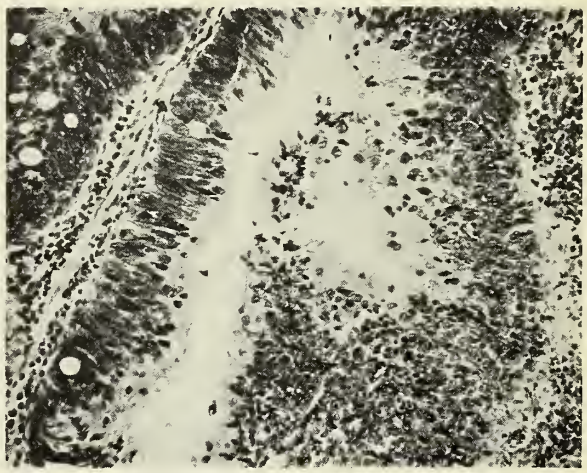


Fig. 4. Adenomatous polyp showing early adeno-carcinoma.

tion. In our own case of multiple polyposis, the rectum and sigmoid were observed frequently through the proctoscope, and from time to time numbers of the larger polyps were removed with the snare, until at the end of two years, cancerous change occurred more or less suddenly at the rectosigmoid junction where the tumors had previously been benign (Figs. 5, 6, 7, 8). From the fact that single benign tumors are frequently seen in young children, one infers that many children have them and go untreated. If these tumors all ultimately become malignant, cancer of the rectum should be more common in early life than is the case, although we have no evidence to prove that these polyps do not remain benign until advanced age and then, only, become cancers. Single polyps are frequently found incidentally during autopsies on persons of advanced age, and have apparently produced no symptoms. Ewing believes that the polyp, which he calls "inflammatory adenoid hyperplasia" demonstrates more clearly than any other process the logical transition from simple inflammatory hyperplasia to carcinoma. Verse thinks that most gastro-intestinal cancers have their origin in adenomata which have arisen from simple inflammatory hyperplasia. In our own series of twenty-five cases, six of the single polyps showed carcinomatous change. It is entirely possible that if every carcinoma of the rectum might be seen

early enough it would prove to be morphologically similar to the six in our series, that is, with a base narrower than the body of the tumor.

Diagnosis.—First, a routine rectal examination should be made of every patient coming for a complete examination, with a thorough investigation of the symptoms of rectal bleeding, instead of a dismissal of it as having its origin in hemorrhoids. In the Massachusetts General Hospital in two years 85 per cent of cases of carcinoma of the rectum coming to operation had been treated for the relief of hemorrhoids within the previous two years. Secondly, rectal examination should be made of all patients with rectal symptoms. By the above should be meant patients with pain about the anus, rectum, sacrum, back of thighs, or left lower abdomen, alterations in the size, shape, consistency, constituents, or color of the stool, deviations from the normal in the sensations accompanying the bowel movements, blood or discharge, constipation coming on suddenly, or diarrhea. Any of these symptoms should certainly be the indication for digital examination, many of them for a proctoscopic examination. As was said earlier, 45 per cent of all benign tumors of the intestinal tract are within reach of the examining finger. On digital examination these tumors are smooth, fairly hard and firm, but not with the firmness of a carcinoma, and usually they may be identified as being definitely pedunculated. Seen through the sigmoidoscope with the patient either on the Haines table or in the knee chest position they present themselves as bright red, glistening round masses, sometimes lobulated like a mulberry, which ooze blood freely when rubbed with an applicator or agitated with the end of the instrument. There is a definite difference in the appearance of a benign polyp from that one which has undergone malignant change which is hard to describe, but which often gives a strong suspicion before a biopsy is made.



Fig. 5. Benign adenomatous polyp removed from patient having multiple polyposis.

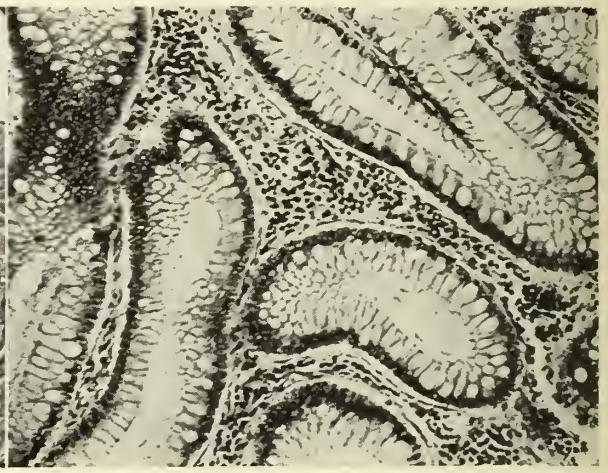


Fig. 6. High magnification of specimen shown in Fig. 5. Glands lined with normal epithelium of the columnar type. Cells filled with mucus.

Symptoms.—The symptoms vary from none at all in the case of early or very small tumors to occasional bleeding, and, depending on the size and location, tenesmus and a sense of incomplete evacuation, to a complete obstruction or intussusception. The symptoms in my twenty-five cases were as follows:

TABLE 5

No symptoms	5
Bleeding only	7
Bleeding and irritation	1
Bleeding and discharge	2
Bleeding and prolapse	4
Prolapse only	1
Bloody diarrhea	2
Sense of incomplete evacuation	1
Pain referred to bladder	1
Obstruction	1

It will be seen that of the twenty-five patients, sixteen had bleeding as one of their symptoms. Regarding blood in the stool as a symptom of carcinoma, Jones has the following to say: "Blood is also present with polyps of the colon or rectum, a condition we have become more and more to believe to be of great importance, of even greater importance than carcinoma itself, for

polyps frequently become carcinoma, and proper treatment before they become malignant means permanent cure." One of our cases had been diagnosed as ulcerative colitis and treated as such for several weeks, while another patient was told she had "intestinal flu." Each had a palpable tumor in reach of the examining finger.



Fig. 7. Section of malignant polyp removed from patient having multiple polyposis. Glands large and irregular.

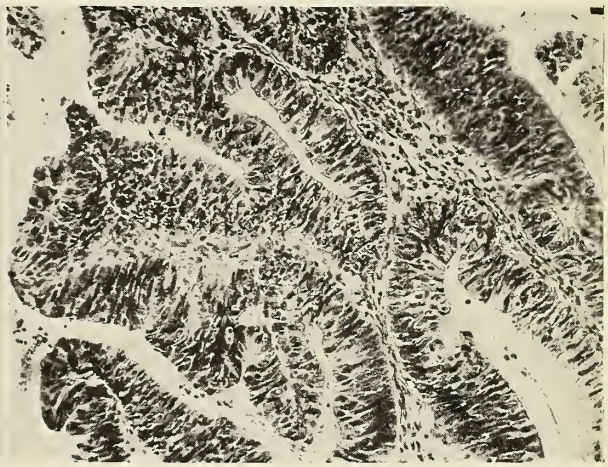


Fig. 8. High magnification of specimen shown in Fig. 7. Giant glands lined with atypical columnar epithelium.

Treatment.—Adenomatous polyps should be considered as distinctly premalignant growths and as such should be eradicated when seen. The low-lying tumors may be prolapsed after the sphincter has been relaxed with novocaine, and, after the pedicle has been ligated, the tumor may be removed. Those which are too high to draw through the anal orifice may be removed with the snare through the proctoscope. There are one or two precautions to be observed in this procedure. In the case of a tumor situated above the peritoneal reflection, it is readily seen that too much tissue may be included in the snare so that when it is drawn taut, an opening into the peritoneal cavity may result. Care should be taken to grasp only the pedicle. Secondly, there may be rather troublesome bleeding if a cold snare is used, and the growth removed too quickly. If one uses such a snare the wire should be drawn up very slowly, allowing three or four minutes for the pedicle to be pinched off, in order that the vessels may become closed. The base may be touched with an applicator dipped in some cauterant to insure its remaining dry. In one of our cases a polyp 2 centimeters in diameter was snared from the posterior wall at the rectosigmoid junction. The stump was observed for a time until it was felt that all bleeding had stopped, when the patient was allowed to go home. During the following eight hours he was compelled to empty his rectum four times, each movement consisting of large clots. After the fourth movement he reported his condition and an investigation was made. On cleaning the clots from the rectum a steady drip of blood was seen coming from the stump of the pedicle, and it was only after fulguration that the bleeding ceased. Since that occurrence I have used a high frequency snare and have had no repetition of that embarrassing complication. In my cases the malignant polyps were snared and the bases thoroughly cauterized or fulgurated. In one case radium was used after fulguration. One case went elsewhere for treatment and had a radical excision of the rectum with a permanent colostomy.



Fig. 9. Adenomatous polyp. Inflammatory type.

Of the six cases with carcinomatous change,

one patient died five days after a colostomy for obstruction due to a large carcinoma above his smaller polyp, the other five are alive, at various periods of from three years to four months after removal of the polyps. One of the cases of benign adenoma died later of carcinoma of the bladder, and another of an obstructing carcinoma above his benign polyp. The remainder are alive and well.

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THE FEMALE SEX HORMONE

At the thirteenth International Congress of Physiology in Boston, held in August, 1929, E. A. Doisy announced for the first time the isolation of the female sex hormone in crystalline form. Subsequently, A. Butenandt announced that he, too, had isolated the hormone of the female sex glands in chemically pure crystallized form. In an article describing the product, Butenandt completely ignores the Doisy announcement. Butenandt points out that the substance is free from nitrogen and sulphur, and that it has no connection with protein substances and carbohydrates. In his opinion, a chemical analysis may make it possible to produce the hormone synthetically. As might have been anticipated, the German investigator promptly conferred on his product a trade name controlled through a German manufacturer. Doisy, aided by the Council on Pharmacy and Chemistry, will no doubt choose a scientific name suitable to the nature of the product and to American conditions. (Jour. A. M. A., February 1, 1930, p. 341.)

THE COMMITTEE ON FOODS

More than a hundred products, representing the products of numerous manufacturers, have been submitted to the committee, in addition to several national advertising campaigns by coöperative marketing organizations. This coöperation is welcomed by the committee but obviously has thrown a great burden of work on the committee at the start. Manufacturers have greeted with acclaim the permission to use on packages and in advertising the seal of the committee. Whereas less food is eaten, so far as concerns caloric or energy value, foods have been greatly modified to improve palatability and to provide what are recognized as necessary ingredients in the form of vitamins and mineral salts. It is the hope of the committee that its efforts will give stability to a rapidly growing industry and prevent the sinking of the modern food market in a morass of hokum such as engulfed the drug industry in its developing stages. (Jour. A. M. A., February 8, 1930, p. 415.)

POSTOPERATIVE HYPOTHYROIDISM*

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THE condition of lowered metabolism, or myxedema, following surgical treatment of goiter, although long recognized, has received comparatively less attention than its adverse condition, hyperthyroidism. This is rather surprising when one considers how partial thyroidectomy for goiter has been popularized, especially during the last quarter of a century.

This negligence in the study of hypothyroidism can probably be best explained by the fact that immediate operative results in goiter as a rule are so startling that they are deceiving. A patient suffering from hyperthyroidism will present following operation such an immediate and striking improvement that the surgeon is thrown off guard, and the patient is dismissed as recovered, when weeks or months later a condition of hypothyroidism will supervene which is so insidious in its onset that even the patient does not recognize its beginning, but considers his or her condition as a matter of course, and, with few exceptions, will not seek further attention.

It was the recognition of an occasional case of an immediate temporary hypothyroidism and an occasional case of myxedema, discovered in a partially thyroidectomized individual weeks or months later, that led us to institute a follow-up study of metabolism in all cases of partial thyroidectomy.

The material for this paper consists of metabolism studies in a group of 209 patients who had been operated on for goiter from one to seven years previously. In this group of 209 cases there were fourteen patients with a definite hypothyroidism, in whom the diagnosis had been either suspected or definitely proven and had been under treatment, some haphazardly, others rigorously, with thyroid preparations over a period of months or years.

These patients came in for metabolism study in response to a questionnaire. Recognizing the fallacies that a stereotyped questionnaire may lead to, it was considered wise not to adduce too many conclusions, and therefore the greater part of this paper will be confined to an analysis of the metabolic study.

Since the middle of the Nineteenth Century, when Reverdin,[1] and at about the same time Kocher, first recognized postoperative myxedema, there had been no extensive attempts to follow up goiter cases until the introduction of basal metabolism. Among the earlier contributors of case reports on the continent were von Eiselsberg, Möbus,[2] Munk,[3] and Roux.[4] Bonilla and Blanco Soler[5] state that postoperative myxedema is rare, and that the low percentage of postoperative myxedema is due to the existence of accessory thyroid glands. Seulberger[6] reported a case of postoperative myxedema and tetany in a patient who had a typical Graves' disease with operative removal. Nobel[7] reported a case of postoperative myxedema in a child thirteen years of age.

Since the introduction of basal metabolism, systematic study and follow-up systems have been attempted, not only in goiter series but also in so-called medical hypothyroidism. King[8] has reported thirty-six cases of hypothyroidism occurring in hospital patients, from a group of 200 cases, only three of which followed thyroidectomy. Jordan[9] has reported eighteen cases in which the basal metabolic rate ranged from minus 16 to minus 27; five only (.9 per cent) had clinical myxedema necessitating treatment. Smith, Clute and Strieder[10] reported an incidence of postoperative myxedema of 15 per cent in 100 patients who had been followed for one year after operation. Thompson and Thompson[11] have made an exhaustive study of metabolism, and report in a group of permanent low metabolism, with permanent myxedema, an occurrence of 2 per cent in 465 cases, 130 of which had been treated by *x*-ray alone, and in this group the incidence of myxedema was 4 per cent.

For the diagnosis of postoperative myxedema, I consider essential a low metabolic rate following an operative attack upon the thyroid, edema and a definite improvement in general and an increase of the basal metabolic rate to normal, under thyroid medication.

*From the Duluth Clinic, Duluth, Minnesota. Presented at the annual meeting of the Northern Minnesota Medical Association, Bemidji, Minnesota, September 3, 1929.

In this group of 209 cases, there were forty-five with basal metabolic rates of minus 10 and lower. I have selected those with rates of minus 10 and lower because I soon learned that there were no cases of definite hypothyroidism with basal metabolic rates above minus 10—in fact, as a general rule, the lower the metabolism, the more definite and striking the hypothyroidism. There were some cases where the rates fell between 0 and minus 10, and because of rather indefinite complaints they were put on desiccated thyroid, and were kept under observation and their rates rechecked; but none of them experienced any improvement when their metabolism was elevated.

In this large group of forty-five cases with metabolic rates less than minus 10, there were two natural divisions: the first, those with a definite hypothyroidism, of which there were twenty-five, with basal metabolic rates ranging from minus 14 to minus 44, and a second group, which I wish to term low metabolism without myxedema, with rates from minus 10 to minus 15, of which there were twenty. In this second group there were fourteen females and six males; the ages ranged from 25 to 62 years. Eleven, or approximately one-half, followed subtotal thyroidectomy for exophthalmic goiter; six followed resection for non-toxic adenomata; and three followed subtotal thyroidectomy for what we wish to term "borderline" cases. In seven cases, or approximately one-third of the group, there were no complaints whatsoever. Seven, or another third, had a definite neurosis, and this group included all the borderline cases. In four of the last group there was some suggestive improvement, although there was still a persistence of neurotic complaints.

Of the twenty-five cases which fell into the definite group of hypothyroidism, the basal metabolism, as mentioned before, ranged from minus 14 to minus 44. In this group there were twenty-four females and one male; the ages ranged from 20 to 63 years. Nineteen, or approximately four-fifths of the cases, followed subtotal thyroidectomy for exophthalmic goiter. There were three each following operation for non-toxic adenoma and toxic adenoma. Five cases of this group had had multiple operations upon the thyroid.

The diagnosis of many of these cases was obvious on inspection. It will be remembered that in fourteen of the group of twenty-five cases the diagnosis had either been suspected or definitely proven months or years before, and have been under observation innumerable times since operation.

Weakness and fatigue were the outstanding subjective complaints. The others, in the order of their importance, were dyspnea, palpitation, a feeling of being too cold, and a dry skin.

Objectively, the findings varied somewhat. It will be remembered that several of the patients, when they came in for this metabolic study, were already taking their daily dose of thyroid, and in these, at that time, there was not much deviation from the normal, although I recall vividly that in some of these cases, following thyroidectomy, there was the classical picture of myxedema, with edema, loss of hair, dry coarse skin, and mental and physical sluggishness.

In one-half the cases, and this is true also of the group of low metabolism without myxedema, there was no gain in weight. The remaining half showed an average gain of approximately twenty pounds.

The outstanding objective finding was edema of the face and extremities. This varied a good deal with the degree of myxedema, but in a few of the cases it was very marked. Other outstanding objective findings included a dry scaling skin. In some of the more marked cases the skin had the appearance of being tough and inelastic. Another striking change was the loss of hair, especially from the eyebrows, and a change in the texture of the hair from a fine to a coarse type. Another change was a characteristic physical and mental sluggishness. Many of these people found great difficulty in arousing themselves in the morning and many of them again complained bitterly of mental apparitions.

In only four cases of this group was the blood pressure elevated, and this was explained on the basis of a concomitant essential hypertension as these patients were all over fifty years of age.

In only six cases was there a definite anemia.

In the treatment of these cases an attempt was made to bring the metabolism up to a normal level and to maintain it at that level by frequent repetition of the basal rate reading. It will be remembered again that fourteen patients had been taking thyroid gland, either as the desiccated whole gland or the extract or as thyroxin, intermittently for months or years. Most of

them had learned to regulate their dosage by experience. It was found that there was a definite improvement both subjectively and objectively in every case.

Summary.—A group of 209 cases in which subtotal thyroidectomy for goiter had been performed from one to seven years previously is reported. Of this number, twenty-five, or approximately 8 per cent, had a definite hypothyroidism or myxedema. In this group the basal metabolism ranged from minus 15 to minus 44.

Another group of twenty cases, with basal metabolic rates ranging from minus 10 to minus 15, was not materially benefited by thyroid medication.

The outstanding subjective complaints were weakness and fatigue.

Objectively, edema and a metabolic rate of minus 15 or more were the significant findings.

Conclusions.—1. Postoperative goiter cases merit more careful study and more rigorous follow-up, especially in regard to their metabolism.

2. A certain percentage, in this series approximately 8 per cent, show a definite hypothyroidism after subtotal thyroidectomy.

3. Proper thyroid medication will improve every case of definite hypothyroidism.

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EARLY OR LATE OPERATIVE TREATMENT IN COMPLICATIONS OF ACUTE OTITIS MEDIA*

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BEFORE I go into the selected theme, I want to say a few words about the etiological, anatomical, and pathological processes, and the clinical symptoms in acute otitis media.

1. In regard to the etiology of acute otitis media: There are just as many causes for acute purulent otitis media as there are diseases in human beings. Each one of them can be the originating factor. To begin with, all infectious diseases like scarlet fever, la grippe, and many others, can cause otitis media. In these cases the otitis media is a part of the generalized morbidity, but in all cases of otitis media one is able to find a general or local disease as the etiological factor. But, whatever the original cause may have been, one thing is certain, that it is an infection of the tympanic cavity by certain organisms. From a scientific standpoint, it has not yet been proved that the tympanic cavity is free from organisms, but from a clinical point of view we can call the tympanic cavity sterile. In the diseased tympanic cavity we nearly always find bacteria. Its four main offenders are: *the streptococcus pyogeneous, streptococcus mucosus, diplobacillus lanceolatus,* and the *staphylococcus aureus.*

Naturally many other microörganisms are found in acute otitis media besides those just mentioned, especially those which cause the different infectious diseases, like diphtheria, typhoid fever, and so on.

2. The mode of infection: In 90 per cent of all cases the infection of the tympanic cavity is caused by the way of the Eustachian tube and usually along the surface of its epithelium. The hematogenous source of infection is much more rare.

3. Predisposing causes for infection: These for instance may be a lymphatic habitus of children, emaciation, local obstruction of the Eustachian tube from hypertrophic tonsils and adenoids, or congenital defects in the epipharyngeal area.

4. Pathologic anatomic changes of the mucous membrane of the tympanic cavity: At first the mucous membrane is infiltrated, then edema follows, later the stage of exudation, and if the process does not come to a standstill, at that stage, the bony structure will be also involved, and we have a regular local osteomyelitis.

5. The clinical symptoms: The first clinical subjective symptom of a beginning otitis media is earache, which is one of the most severe pains human beings are liable to suffer, as everybody who ever had earache can verify. Often with it comes tinnitus aurii of a pulsating character. A diminution of hearing accompanies these symptoms, but it is not very noticeable in the beginning. Some patients also complain of dizziness. The local retroauricular glands are swollen, and quite often one finds tenderness over the mastoid process, even in the beginning stage. General symptoms of otitis media are: chills, fever, and nausea.

6. Course and prognosis: Sequela: (a) a slow recession of all symptoms without perforation of the ear drum by the accumulated exudate. (b) Perforation of the ear drum by the purulent exudate. (c) The acute otitis media becomes chronic. (d) Manifestations of complications, the beginning of which is nearly always some bone involvement.

7. Treatment: (a) General therapeutic measures, like rest in bed, aspirin, and laxatives. (b) Local treatment: Phenol glycerin or cocain drops, hot applications and finally paracentesis. (c) After treatment: The ear canal is kept as clean as possible. Some use only dry cotton; some irrigate the canal with boric solution or hydrogen peroxide.

After this brief description of the usual course of acute otitis media we come to the question, what are the indications for operative procedure in acute otitis media? Unfortunately, medical science is not far enough advanced to prevent complications by conservative treatment in every case of otitis media. On the contrary, our remedies for the treatment of acute otitis media are

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about the same as they have been for the past twenty-five years, and they are mostly symptomatic. A famous otologist once said, "Our medical remedies in otitis media are so few, that we can write them on one finger nail." But we can be of more help to those otitis media patients in whom complications have set in. Here, surgery has its place and cases which were hopeless before the surgical era, can be saved nowadays, thanks to the advancement of surgery in this special field. A paracentesis performed at the right time is just as much a life saving operation as an appendectomy in acute appendicitis. Therefore our ambition should be to increase our knowledge steadily regarding the indications for operative procedure in acute otitis media, which are not so well established, as for instance, the indications for surgery in acute appendicitis.

Especially in the last few years there has been a great deal of difference of opinion among otologists as to the right time for surgical procedure in complications of acute otitis media. Some prefer to operate as soon as the slightest symptom of a possible complication appears. Others wait and treat such cases conservatively and more observingly. The first group operates every otitis media, which has not stopped draining after two weeks of conservative treatment, the later postpones surgery as long as possible, until certain symptoms of complications have manifested themselves, asserting that such a conservative attitude does not endanger the life of the patient more than many unnecessary operations performed by those who follow the radical method.

The indications for mastoidectomy as generally established seem to be:

1. Objective symptoms of a destructive process of the bony structure, that is, infiltration or abscess formation in the mastoid process or its surroundings, sagging of the posterior wall of the ear canal, or symptoms of a fistula of the inner ear.

2. Where the discharge from the ear constantly is very profuse or even increases in spite of several weeks of conservative treatments.

3. When repeated paracentesis has been unsuccessful.

4. Persistent increased temperature. Besides these subjective and objective signs of bone destruction are others, more generalized symptoms, which indicate surgery in otitis media, for instance, loss of weight and poor appetite in the course of an otitis media, or meningeal irritation and a pathological spinal fluid indicating a threatening intra-cranial complication. The conservative group among the otologists followed the rule, never to operate before three weeks have elapsed since the onset of the otitis media. The rule may be right when the otitis media takes the usual course as described in text books. That is, during the first week is the stage of pain with a constant fever curve. The second stage is that of sero-purulent secretion, and decrease in the fever. The third stage is accompanied by purulent secretion, and an increase of temperature.

Quite often one notices even in the first stage a tenderness over the mastoid process upon pressure, known as matoidismus. This does not indicate that the bony structure must be effected; but a tenderness over the mastoid process at the end of the second or at the beginning of the third week means a complication in the course of otitis media.

But only a small percentage of otitis media cases take such a typical course. One often observes cases which do not fit in any of the previous mentioned stages. They are the ones which require painstaking examination and observation to enable us to decide whether surgical or conservative treatment should be adopted.

I shall mention here a few cases which show such an abnormal course, and so give quite a different indication for the operation. At the clinic of Professor Neumann[1] in Vienna, a series of cases were reported in which the otitis media, following a grippe epidemic, took a very foudroyant course. In these cases, two days after the beginning of earache, signs of meningeal irritation were manifest, like nausea, dizziness, pain in the occiput. In spite of immediate paracentesis no improvement took place. The spinal fluid was cloudy, showing an increased cell count, polymorphoneuclear leucocytes predominating. On account of these findings mastoidectomy was performed, very little pus being found in the pneumatic cells and antrum. A couple of days later the patient died. The autopsy showed a localized meningitis at the site of the affected ear. Similar cases were described recently by Otto Mayer.[2] Among these cases is one especially interesting, because it came under observation of an otologist from the very beginning of the morbidity.

A fourteen year old boy complained of earache. The otologist was consulted immediately. He made a diagnosis of beginning otitis media. The temperature was

100 degrees followed by a rise in temperature to 101 the same evening. A paracentesis was done. Two days later nystagmus and dizziness set in, with diminution of the hearing, so that a whispering was heard at a distance of two meters only. Kernig's sign was positive, and the spinal fluid cloudy. Thereupon mastoidectomy was done. In the mastoid process large cells were found, but no pus, and in the antrum a hemorrhagic exudate (streptococcus). Death followed fourteen hours after the operation.

Another case which came under my observation shows also how fast complications can develop.

This patient had terrific earache ten days after a normal childbirth. She was still in the hospital and therefore was also observed from the beginning. Examination a few hours after the onset showed a much inflamed ear drum with bleb formation. A paracentesis was done, hemorrhagic exudate escaped, and the patient obtained temporary relief. Two days later the temperature rose to 102, the pain increased, and there was tenderness over the mastoid process. The discharge from the paracentesis opening being very scant, a second paracentesis was done, and again a temporary relief followed. But the temperature remained high on the following day, the tenderness over the mastoid process was more marked, and at the tip of it a swollen area was noted, which indicated a probable perforation through the bone. On account of this, mastoidectomy was done. Pus was found in all the pneumatic cavities, especially at the tip, but no perforation. The sinus was free. Two days after the operation the temperature was close to normal, and the patient made an uneventful recovery.

In this case there was a fully developed mastoiditis on the fifth day after the onset. Usually this kind of a complication is hardly to be expected before the second or third week after the onset. The childbirth may have played a part in this case. The resistance was lowered and therefore the local infection of the ear could spread much quicker in the neighborhood and developed a complication in such a short time.

The opposite course in otitis media, I observed just recently in a ten year old boy.

This patient had repeated attacks of earache for a week before I saw him. Upon examination I found an inflamed ear drum with bleb formation, and besides a swelling in the temporal region extending over the zygomatic process to the external canthus, moderate tenderness, and a temperature of 100 degrees. The mastoid process itself was not tender, so we had an acute otitis media with the onset of complications in the bony structure. Here the pneumatic cells were abnormally located in the temporal region, and there the bone involvement originated. Paracentesis was done immediately and a considerable amount of purulent fluid escaped. Hospitalization was advised for further observation. The pains decreased, but the swelling over the zygomatic process increased, involving the whole temporal region and right eye, which showed a marked edema of the lid. The temperature was stationary. Operation seemed to be unavoidable, and was recommended by a consultant; but further observation was justified, because we know that such cases seldom cause any intracranial complications like sinus thrombosis or a brain abscess. The next few days showed marked improvement in the condition of the ear drum, the inflammatory process ceased, the discharge decreased, the temperature became normal and there was less pain over the swollen area. The patient made an uneventful recovery from then on.

In this case, according to rules generally applied, surgical intervention would have been indicated, but close clinical observation saved the patient from it.

Paul Hopkins[4] from St. Mary Victoria Hospital in Berlin, recently published statistics of 303 cases of acute otitis media which had been operated. His statistics are based from the onset to the time of operation. He divided them into three groups according to the time of operation, whether during the first, or second, or third week (or later) following the onset of symptoms. In his experience it did not make a great deal of difference at what stage these patients were operated upon, as far as probable complications, like sinus thrombosis, brain abscess, meningitis, and mortality were concerned. On the contrary he found a greater mortality in patients who were operated during the first week following the onset. The reason for this he believes, is the virulence of the infection, and a low resistance of the individual in the first week.

It was thought that roentgenology would be of a great help in determining the right time for surgical intervention in acute otitis media. But our expectations were not quite fulfilled. For instance in children, radiology is of very little help, because we find not infrequently in the first stage some haziness in and density of the mastoid process, which may lead to false interpretation and in turn to an unnecessary operation. In children apparently every otitis media shows some effect on the mastoid process, but in nearly 90 per cent of these cases all these symptoms subside without any further complications.

In adults, the radiogram shows us the distribution of the air cells in the mastoid process. Pathologic conditions in the mastoid may cause bony destruction which would be indicated in the radiogram by increase in density. But in normal cases there are variations in the air content of the mastoid process, which is reflected in the radio-

gram, without meaning that pathology is present. In advanced cases of mastoiditis, the radiogram gives us full information about bone destruction, confluence of mastoid cells and formation of abscess cavities. But in this stage the clinical symptoms are usually so outspoken that a correct diagnosis can be made without a radiogram, and the proper treatment instituted.

In spite of all the technical help which is at our disposal nowadays, we still have to rely on the clinical findings and personal experience, more than on anything else, to determine when operative treatment is indicated in complications of acute otitis media, and so we may draw the following conclusions:

1. It is impossible to decide at the onset, whether a case of acute otitis media belongs to the group where early surgical intervention is necessary, or to a group where conservative treatment has its place.

2. Painstaking clinical observation only can decide the right moment for operative procedure.

3. Complications like meningitis, sinus thrombosis, brain abscess, can occur at any stage in the course of otitis media.

4. The end results of the treatment of acute otitis media do not vary a great deal, whether the case has been operated in the early or late stage. Apparently the more conservative method has produced better results than the more radical one.

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VIGANTOL NOT ACCEPTABLE FOR N. N. R.

When reports of experimental clinical studies made it apparent that irradiated ergosterol preparations would be offered for therapeutic use, the Council on Pharmacy and Chemistry undertook to select a name for this vitamin D bearing product. The Council did this so that products of this kind might be marketed under a single name and thus the confusion avoided which inevitably results when the same product is marketed under a multiplicity of names. The Council adopted "Viosterol" as the New and Non-official Remedies name for irradiated ergosterol and the name "Viosterol in oil 100 D" to designate a preparation containing the substance dissolved in oil and having one hundred times the vitamin D potency of a standard cod liver oil. Four firms have made their products acceptable under the Council name for inclusion in New and Nonofficial Remedies. The Winthrop Chemical Co. is offering to physicians of the United States a brand of viosterol in oil 100 D under the proprietary name "Vigantol." The Council declared "Vigantol" unacceptable for New and Non-official Remedies because the application of a proprietary name to a preparation of irradiated ergosterol is contrary to the best interest of the medical profession and of the public. (Jour. A. M. A., February 8, 1930, p. 410.)

HERNIAL (INYECCIONES PROLIFERANTES OBTURADORAS DEL DR. E. PINA MESTRE) NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that the product "Inyecciones Proliferantes Obturadoras," stated to be manufactured by Dr. E. Pina Mestre of Barcelona, Spain, was presented to the Council for consideration under the name "Hernial" by the Vincent Ruiz Co., New York. According to the information submitted by this firm, "Each ampule contains approximately 98% of alcohol, and the balance consists of the following ingredients expressed in percentages: 25% Krameria, 16% Katechu, 15% Rosa Canina, 15% Rosa Centifolia, 14% Vaccinium Myrtillus, 15% Monesia." The preparation is proposed for use by injection in the treatment of hernia. The Council declared Hernial (Inyecciones Proliferantes Obturadoras del Dr. E. Pina Mestre) unacceptable for New and Non-official Remedies because it is an unscientific, indefinite and complex mixture of astringent drugs proposed for use in the treatment of hernia, for which unwarranted claims are advanced and the use of which is not warranted by the available evidence but, on the contrary, is considered to be dangerous. (Jour. A. M. A., February 1, 1930, p. 339).

PROBLEMS IN PLASTIC SURGERY OF THE NOSE*

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PATIENTS who present themselves for the correction of nasal deformities are usually of three types: (1) those with some minor deformity, the result of an injury, such as a humped or crooked nose, or a nose that it too long, too short or too broad; (2) those with a major defect such as a marked saddle-back deformity, or loss of the ala or the greater part of the nose from syphilis, or the result of malignant destruction, and (3) those with an imaginary deformity which to them is marked, and about which they are extremely sensitive. Patients in the third group are usually psycho-neurotic, and require careful treatment. I am reporting here six cases, that are illustrative of some of the problems in the surgical treatment of nasal deformities.

SADDLE-BACK NASAL DEFORMITY

Case 1.—A girl, aged eighteen years, came to The Mayo Clinic October 21, 1929, for correction of a saddle-back nasal deformity. Her nose had been injured ten years previously, and an abscess had formed and required drainage. The saddle-back deformity had resulted. Treatment had not been given.

Examination revealed the tip of the nose to be turned up (Fig. 1). The septum was not markedly deformed. The Wassermann reaction of the blood was negative. Operation was performed, October 24, 1929, under intratracheal ether anesthesia, at which time a full thickness of the cartilage of the right eighth rib was removed. The wound of the thorax was closed in the usual manner with catgut, silkworm and dermal sutures, leaving a silkworm drain for a few days to take care of any oozing that might occur. A pressure dressing with adhesive plaster was used over the lower part of the thorax. The skin and subcutaneous tissue over the tip and the bridge of the nose up to the glabella was well freed by means of dissecting scissors, through a small incision just below the tip of the nose. After the cartilage had been shaped to conform to the deformity, it was inserted through the incision. The wound in the nose was closed with dermal sutures. A splint or pressure dressing was not applied. Figure 2 shows the postoperative result.

Case 2.—A woman, aged forty-six years, came to the clinic, June 12, 1928. One year previously the patient had been injured in an automobile accident, receiving a fracture of the base of the skull and of the lower jaw, a compound fracture of the nose, and several lacerations of the face. Immediate emergency treatment had been given, but nothing further had been done for the nose. The patient desired a plastic operation to correct the external nasal deformity as well as the difficulty in breathing through the nose.

Examination revealed a posttraumatic deformity of the nose with a marked saddle-backed nasal deformity (Fig. 3). There was displacement of the nasal bones to the right and considerable thickening of the lower part of the bones on the right side. A scar was present across the nose, extending from below the left eye across the bridge to the right cheek. There was complete atresia of the right nostril, partial atresia of the left nostril and complete traumatic atresia of the left external auditory canal. General examination disclosed chronic cholecystitis with stones, and adenomatous goiter without hypertension.

The patient was operated on June 16, 1928, at which time both nasal bones were refractured and reset in position. An opening was made into both nostrils and rubber tubes were inserted in order to maintain the openings. A copper splint was applied, with a dressing of adhesive plaster. The bones healed nicely in their new position. On July 10, the atresia of the left external auditory canal was freed and the scar was dissected out as thoroughly as possible. A number 18 French catheter was inserted into the canal. The patient was dismissed three weeks later with the rubber tubes still in position in the nostrils and the canal of the ear to be replaced and taken care of by her home physician.

The patient returned, January 3, 1929, with an excellent result of the external nasal deformity. She was still wearing the tubes in the nose, but she had practically a normal ear canal.

July 10, 1929, the patient returned again for correction of the external nasal deformity. By means of intratracheal gas anesthesia a large piece of cartilage was removed from the right eighth rib. The patient was very fat, which made the removal more difficult than usual. The cartilage was inserted to elevate the saddle-back nasal deformity through a small incision just below the tip of the nose. Figure 4 shows the postoperative result.

Comment.—Case 1 represents the deformity that occurs following injury before the nose was fully developed, and case 2 represents the deformity following injury after the nose has developed. Traumatic atresia of the nostrils and the external canal of the ear are best taken care of by means of rubber tubes. The size of the tubes may be increased from time to time, until the nostril or external canal is as large as is thought advisable. It is usually necessary to leave the rubber tubes in place for at least six months. Then the tube should be left out for

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short periods and replaced if there is any tendency for the opening to contract, the period of time the tube is left out being gradually lengthened. Although a full-thickness skin graft or a Thiersch graft may be used on the rubber tubes in the nose, the tube alone gives satisfactory results.



1 2

Fig. 1 (Case 1). Traumatic saddle-back nasal deformity, the result of an injury when a child; the turned-up nose is shown.

Fig. 2 (Case 1). Postoperative appearance after cartilage implant.

Cartilage or cartilage with bone, as advocated by Carter, is the most satisfactory material for the correction of saddle-back deformity. It is always advisable to take a full thickness of the rib, no matter how small the deformity. Small portions elevated from one side of the rib usually are of little value. The perichondrium is always removed, except in cases in which it is left in place in order to give that portion of the implant a curve or concavity. In case 1, the turned-up nose was corrected by lengthening it with cartilage.

The most important part in the correction of this type of deformity is the fitting of the cartilage to the remaining portion of the nasal bones. Accurate observation of the outline and slope of the nasal bone where the cartilage implant will approximate is necessary. Although various sites may be selected for an incision, the small incision below the tip of the nose, similar in shape to a flying bird, seems to be the most satisfactory. These patients experience very little local reaction. They are usually uncomfortable and in bed for a day or so on account of the removal of the rib. The sutures in the nose are removed on the third or fourth day.

SCOLIOTIC OR HUMPED NOSE

Case 3.—A woman, aged twenty-eight years, came to the clinic, September 17, 1928, for the correction of a deformity of the nose which had been present since birth. Originally her nose had been large and broad with a hump in the bony bridge and a long tip. Six years previously her nose had been injured in a basketball game, a minor fracture being sustained. This did not seem to change the deformity. The patient was anxious for improvement.



3 4

Fig. 3 (Case 2). Traumatic nasal deformity with complete atresia of both nostrils and displacement of the nasal bones, corrected by means of refracturing the nasal bones, placing of rubber tubes in the nostrils, and later, a cartilage implant.

Fig. 4 (Case 2). Postoperative appearance.

Figure 5 shows the deformity at the time of examination. Operation was performed, September 21, 1928, under local anesthesia with 0.5 per cent procaine. An incision was made, inside the vestibule of the nose on both sides, and the entire subcutaneous tissue and skin was freed over the dorsum and lateral portions of the nose. The hump was removed by means of a heavy bone forcep. The nose was shortened and the tip was raised by removing a V-shaped piece from the septum and lateral alar cartilages, closing the incisions with mattress silk sutures. Figure 6 shows the postoperative result.

Case 4.—A man, aged twenty-nine years, came to the clinic, October 1, 1924, for the removal of a nasal hump. The patient had fallen and struck his nose at the age of three years, and a thickening formed at this point which gradually increased. Two weeks previous to examination, the patient was struck on the nose with a croquet ball, which apparently accentuated the deformity.

Examination revealed a marked hump extending from the glabella down to about 0.5 cm. above the tip of the nose (Fig. 7). The nose was markedly thickened laterally. A deflected septum completely obstructed the right side of the nose.

October 4, 1924, submucous resection was done under local infiltration and block anesthesia. October 13, the tissues were freed over the bridge of the nose, and the

bony hump, which stood up 1.5 cm. and extended from the glabella down to just above the tip, was removed by means of bone forceps. Figure 8 shows the postoperative result.

Comment.—The correction of minor deformities, as shown in these two cases, has a definite place in plastic surgery of the nose. In case 3, although the deformity was not marked, the patient was sensible and felt that the correction of this slight deformity was well worth while. In these cases it is well for the patient to understand just how much to expect. It is of little use to tell the patient to go home and forget the deformity, as most of these patients know just what they want done, and are perfectly satisfied if the work is done correctly. In Case 4, the deformity was more obvious, and the correction put the patient in a much better position to earn a living. The use of rasps in these cases frequently stimulates overgrowth of bone which appears secondarily, so that removal of the humps of bone with saws or bone forceps is the preferable method.



5 6

Fig. 5 (Case 3). Slight nasal deformity; the slight hump and the long tip of the nose are shown.

Fig. 6 (Case 3). Postoperative appearance after removal of the hump by an intranasal incision and shortening the tip.



7 8

Fig. 7 (Case 4). Marked hump of the bridge of the nose, following injury.

Fig. 8 (Case 4). Postoperative appearance after removal of the hump by means of an intranasal incision and bone forceps.

SYPHILITIC NASAL DEFORMITIES

Case 5.—A girl, aged seventeen years, came to the clinic originally, November 29, 1921, on account of hereditary syphilis. At that time there was complete loss of the columella and the bony and cartilagenous septum. She had been given antisyphilitic treatment for a long time, until it was thought advisable to attempt to correct the deformity.

At the time of examination, March 16, 1925, there was a saucer-shaped deformity of the face with flattening of the nose and upper lip (Fig. 9). There was loss of the columella as well as of the lining of the tip and both alæ. The cartilagenous and bony septum was entirely gone.

Several plastic operations were done in an attempt to correct the deformity in a conservative way, with little real benefit. It was decided to raise a flap from the forehead and then to bring it down, turning in the lower portion on itself in order to form the lost portion of the lower third of the nose and make a columella. The first operation to elevate the flap from the forehead, with a pedicle in the region of the glabella and the distal end running into the left forehead, was done February 4, 1929. After two weeks the flap was brought down into position, after the skin had been excised over the remaining portion of the tip and ala. The flap was turned in on itself to form the columella and ala on both sides of the lost tip. Rubber tubes were inserted in the nostrils to maintain the vestibule, and mattress sutures were carried through the skin to hold the nose and ala in position. A full-thickness skin graft replaced the distal portion of the flap on the forehead. After the flap had been in position about two weeks, it was partially cut across, and a few days later completely cut across and sutured back to the forehead. The suturing of the upper part of the flap on the nose was completed. Figure 10 (November 19) shows the postoperative result with the columella and nasal vestibules.

Comment.—Syphilitic deformities may be the result of congenital or acquired syphilis. In congenital syphilis the saucer-shaped face, with loss of the lining of the nose and the columella, is the most common deformity. The saddle-back deformity in these cases may be corrected in the usual manner, by means of a cartilage implant, but the saucer-shaped face usually requires the bringing forward of the nose and the upper lip

by means of an operation suggested by Blair. Replacement of the columella may be done by elevating a flap from the upper lip with a pedicle at its upper portion, and after the under surface is lined with a full-thickness graft, it may be brought up in position and sutured to the posterior surface of the tip of the nose. The wound



9 10

Fig. 9 (Case 5). Syphilitic nasal deformity; loss of the intranasal tissue and the columella.
Fig. 10 (Case 5). Reconstructed skin and lining of the nose forming a columella with a flap from the forehead.

in the lip is closed primarily. The loss of the entire lining of the nose in adults may be replaced by the use of dental compound covered with a Thiersch or full-thickness skin graft attached by means of a splint to the upper teeth, first freeing the entire skin over the nose and bringing it forward. This method was suggested by Gillies. The use of a full-thickness skin graft, however, gives a more dependable lining than the Thiersch graft. In case 5 the loss of the lower third of the nose, with the lining in the columella, was corrected by means of a flap from the forehead, following the method of Nélaton.

POSTOPERATIVE LOSS OF A PORTION OF THE NOSE

Case 6.—A man, aged thirty years, came to the clinic, February 13, 1928, because of a lesion on the dorsum of the nose, which had been present for five years and had been treated extensively with roentgen rays over a period of two years. Two roentgen-ray burns had developed on the dorsum of the nose and on the left ala. The roentgen-ray treatments were continued, alternated with different types of ointments. Following this he was treated by cautery and ultraviolet and infrared rays. The burns on the nose had become confluent, and an ulcer had been present which would not heal.

There was a crusted lesion over the tip and lower part of the nose, about 2 cm. in diameter, with some extension into the nasal cavity. The condition clinically was a low-grade squamous-cell epithelioma, which had developed in a roentgen-ray burn. The skin over the nose and forehead was very thin, almost like tissue paper, apparently the result of the roentgen-ray treatment.

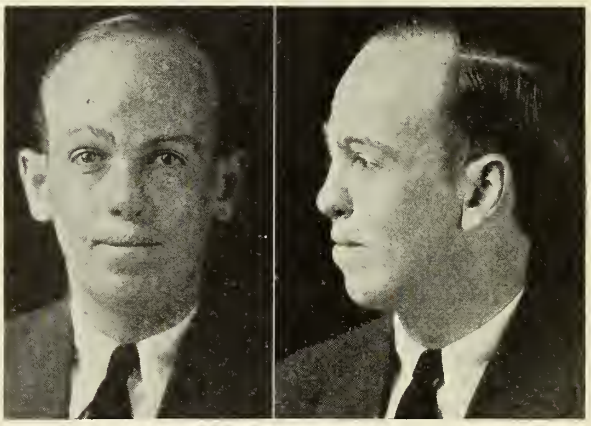
Treatment of the epithelioma of the nose with surgical diathermy was recommended and this was done, February 16, under ether anesthesia. It was thought advisable to wait at least eight months before attempting reconstruction of the deformity that resulted.

The patient returned, October 23, 1928, for the reconstruction (Fig. 11, *a* and *b*). Although the skin over the forehead was very thin, it was thought that this was the most advantageous site for a flap. Skin from the arm was prohibited because of the profuse growth of hair. A flap was raised from the forehead October 24, and the middle portion of the flap was lined with a skin graft according to a method which I have described.[6]



a *b*

Fig. 11 (Case 6). Loss of the nose after removal of a squamous-cell epithelioma; *a*, anterior view; *b*, lateral view.



a *b*

Fig. 12 (Case 6). Postoperative appearance; (*a*), anterior view; *b*, lateral view; the reconstructed nose is shown; the nasal vestibules on either side allow free nasal breathing; there is lack of scarring of the forehead.

The last stage of the plastic work was completed, February 11, 1929. The length of time between the stages had to be increased, owing to the thinness of the skin and the fact that there was practically no subcutaneous tissue. Figure 12, *a* and *b*, shows the result. Cartilage was not utilized to raise the bridge of

the nose. This may be attempted if necessary at a later date.

Comment.—The difficulty of making a complete nose, as was done in this case, was a great problem until within the last few years, when the method of Nélaton, modified by Blair and reported by Ivy, made is possible to construct a fairly good looking nose in a comparatively short time. Although tissue from the arm or thorax may be used, the results are never quite as satisfactory as when a flap from the forehead is employed. It is best, in this type of case, to wait at least six months before attempting the completion of the plastic work, so that any shaping may be done, such as thinning out of the ala and columella and shaping up the nose laterally by removing subcutaneous tissue. In this case the skin was so thin that little was necessary, other than what was done at the time of the primary operation.

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UDGA STOMACH TREATMENT

The formula of Udga is, apparently, secret—at least none of the advertising matter and follow-up letters give it. The Udga Medicine Co., which puts out this preparation, was formerly known as the Phungen Laboratories. The preparation is advertised as a mail-order treatment for stomach ulcer, gastritis and dyspepsia. From tests made in the A. M. A. Chemical Laboratory it appears that the preparation is similar in composition to the Pfunder Stomach Tablets which were found to contain bismuth subnitrate, magnesium oxide and sodium carbonate. (Jour. A. M. A., February 15, 1930, p. 504.)

THE COFFEY-HUMBER CANCER TREATMENT

The publicity, given through Hearst newspapers primarily, to the Coffey-Humber cancer treatment has brought about the very type of injury to scientific research that was predicted. Regardless of the fact that Drs. Coffey and Humber have made it clear that their work is purely experimental and that they do not claim to have developed a cancer cure, the great trek of cancer sufferers across the continent has begun and physicians everywhere are besought by their patients to procure this remedy. (Jour. A. M. A., February 22, 1930, p. 562.)

INTRAMUSCULAR IRON ARSENIC COMP. (NO. 201) AND (INTRAVENOUS) IRON, CACOD. AND GLYCEROPHOSPHATE (NO. 202) NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that a circular with the caption, "Formulas of definite therapeutic value," issued by Sci-Medico, Inc., New York, lists an extensive line of preparations marketed in the form of ampules and intended for intramuscular and intravenous administration and includes the following as having "proved useful in the treatment of anemia, nervous debility, neurasthenia, chlorosis and wherever a general tonic is indicated": (Intramuscular) Iron, Arsenic Comp. (No. 201), each 5 c.c. ampule being stated to contain Iron Cacodylate ¼ grain, Sodium Cacodylate ⅜ grain, Sodium Hypophosphite 3/16 grain, Manganese Hypophosphite 1/24 grain, Sodium Citrate ⅝ grain, and (Intravenous) Iron, Cacod. and Glycerophosphate (No. 202), each 5 c.c. ampule being stated to contain "Iron Cacod. (Colloidal)" 1 grain, Sod. Cacodylate 4 grains, Sod. Glycerophosphate 1½ grains. The Council declared these preparations unacceptable for New and Non-official Remedies because they are irrational mixtures marketed with unwarranted therapeutic claims. (Jour. A. M. A., December 7, 192, p. 1809.)

AFFECTIONS OF THE ROUND LIGAMENT WITH REPORT OF A CASE OF DOUBLE TUBERCULOUS HYDROCELE

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AFFECTIONS of the round ligament are comparatively rare and when present arouse a keen clinical and surgical interest. The round ligaments of the uterus are so frequently dealt with in routine surgical practice that one is apt to consider them merely as structures to be used in adjusting uterine displacements and overlook the fact that various types of pathological processes may develop in them.

Upon reviewing the literature one finds that affections of the round ligament fall into two general groups. In the first group are the tumors which develop in the tissues of the ligament; and in the other group are affections originating in the tissues closely associated with the ligament and drawn into the inguinal canal by it. This latter group includes the cysts and hydroceles of the round ligament.

Tumors are the most frequent affection of the round ligament and they may be either benign or malignant. These tumors are classified as intra-abdominal and extra-abdominal. The extra-abdominal tumors are further divided into: (1) intravaginal growths that push the posterior wall of the canal of Nuck forward and are therefore retroperitoneal; (2) intracanulicular growths situated between layers of the muscles without any connection with the vaginal process of the peritoneum, and (3) preinguinolabial growths situated in front of the external inguinal ring or even in the labia majora. These tumors usually develop in the extra-peritoneal portion of the ligament. The majority of these tumors resemble fibroids of the uterus in point of origin. Malignant tumors practically all consist of malignant degeneration of a fibromyoma and the small round cell sarcoma is the type most frequently found.

In 1914 Taussig[1] reported a case of spindle cell sarcoma of the round ligament and in addition collected five cases from the literature. He states that the round ligament sarcomata are slow growing and are only slightly malignant. He found no cases in which metastasis was described and was unable to find any record of recurrences after operation. In this group of six cases there was only one post-operative death, and that was in the first case recorded. Considering these findings one naturally would be rather encouraged regarding the prognosis in sarcoma of the round ligament, but in 1918 Mönch[2] reported a sarcoma of the round ligament which, within a few months, developed to the size of a child's head. The tumor was removed but the patient died eight weeks later from metastases to the abdomen and the brain. The very rapid course of development of this tumor and death following eight weeks later shows very conclusively the extreme malignancy of the growth. The glands removed at operation were small and showed inflammatory changes. Mönch[3] removed a tumor of the round ligament which proved to be a myofibroma undergoing sarcomatous degeneration. At the time of operation there was no evidence of sarcoma in either the ligament or the inguinal glands but the degree of malignancy of this growth was made evident by the patient's death eight weeks after the operation. It is fortunate that these cases of extreme malignancy have been brought to our attention for if we were to be guided by the results of the cases collected by Taussig our views as to the prognosis of sarcoma of the round ligament would be very optimistic until our ideas were changed by personal experience with this very malignant type of tumor.

In 1903 Emanuel[4] collected eighty cases of round ligament tumors and found that twenty developed intra-abdominally and the remainder were located either in the inguinal canal or the labial fold. Taussig[1] later added sixty-one cases, and of this number eighteen were intra-abdominal and thirty extra-abdominal. These tumors may be multiple and they occur three or four times more often on the right side than on the left. The intra-abdominal tumors usually spring from that part of the round ligament that is nearest the uterus and are very often pedunculated and give symptoms such as are caused by a subserous fibroid or a solid ovarian tumor. The size of these tumors varies considerably and they may be very large before any symptoms are

experienced. They usually assume a round or oval shape and are of a firm consistency.

Ward[5] reported a case of fibroid of the round ligament which weighed three pounds and eight ounces. This tumor arose 3 cm. from the horn of the uterus and the patient had been conscious of a growing mass in the abdomen for six months. The fact that these tumors may develop to considerable size in a comparatively short time is further shown by a most interesting case described by Taddei.[6] This patient had noticed a small hard mass in the right inguinal region for eighteen months and during the five months previous to her examination the tumor grew to the size of an egg-plant. He describes the tumor after extirpation as a fibromyoma. The rapid growth was verified by the microscopic examination as showing the connective tissue to be edematous and growing in between the smooth muscle fibers until the process reached a stage of a most accentuated lymphatic edema with the result that the muscle bundles of the tumor were disassociated.

Tumors in this locality have many of the same peculiarities as tumors developing in other parts of the body. This is shown by the foregoing cases in which a large tumor developed in a few months from a small quiescent nodule. It has been demonstrated further that the growth of these tumors may be stimulated at times by variout local influences. Soli[7] describes a case in which a small tumor had been noticed in the right inguinal region for eight years and this tumor did not change in size until the sixth year, at which time the patient became pregnant and after the fourth month the tumor began growing. It extended to the labia majora and became very painful. It has further been pointed out by Von Zur-Muehlen[8] that direct trauma may play an important role in causing these tumors to grow. Kolb[9] has described a case of fibromyoma of the round ligament that was found when the patient was operated upon for a fibromyoma of the uterus. Thirteen years previously a suspension operation was done for retro-displacement of the uterus. In attempting to explain the occurrence of this round ligament tumor Kolb states that the development of the uterine tumor caused tension on the round ligaments and at the point of attachment to the uterus some of the muscle cells were drawn away with the ligament and the development of the cells resulted in the fibromyoma of the round ligament.

Another type of tumor found in the round ligament is the adenomyoma, which is comparatively rare. This condition was first described by Cullen[10] in 1896. These tumors occur about four times more frequently in the round ligament than in the uterus. They usually are located in the region of the external ring and consist of a firm nodule intimately blended with surrounding adipose tissue. It is most commonly found during the child-bearing period, is slow growing and usually causes little annoyance until it becomes large enough to cause pain on walking or during menstruation. The discomfort evidenced on walking is explained by the intimate association of the tumor with the surrounding tissues. During menstruation these frequently increase in size and become painful, diminishing in size when menstruation ceases. The increase in size of these tumors during the menstrual period is supposed to be due to functioning of the glands as the contents of the glands removed at operation is frequently hemorrhagic. In a series of 141 tumors of the round ligament collected by Taussig there were nineteen cystic tumors found in which the cyst was surrounded by a fibromuscular tissue and three of these cysts contained blood and were classified as hematoma.

Cullen[11] states that there is a difference of opinion as to whether these tumors are derivatives of the Wolffian or the Müllerian duct. Some authors claim that portions of the Wolffian duct have been constricted off during the development of the embryo and have been carried down the round ligament and then developed in later life. They base their opinion on the fact that the Wolffian duct comes in close contact with the round ligament prior to its descent into the inguinal region. They further believe that the gland elements of the adenoma bear some resemblance to portions of the Wolffian duct. Those holding the other view feel that there is strong evidence that misplaced portions of Müller's duct are responsible for the growth of these tumors. It has been known that the glands in these adenomyomata often times cannot be distinguished from normal uterine glands. They are small, round, and lined with cylindrical ciliated epithelium and are surrounded by the characteristic stroma of the normal uterine mucosa. Another point in favor of the Müller's duct origin is that these adenomyomata resemble in every particular the diffuse adenomyomata of the uterus in which the glands are seen to be a direct

derivation of the uterine mucosa. There is no other place in the body in which mucosa similar to normal uterine mucosa is found and furthermore no other mucous membrane that periodically discharges blood. Cullen does not believe that it can be definitely stated that these growths are not derived from remains of the Wolffian duct but he believes the evidence is much in favor of the Müller duct origin. He cites a case in which menstruation commenced on May 18 and ceased May 23 or just three days before operation. On examination of the extirpated tumor the glands were found filled with fresh blood.

Dermoid tumors are found in many different localities but very rarely are they found involving the round ligament. Maccabruni[12] describes a case of a dermoid cyst connected with the round ligament. The condition was diagnosed as a probable right inguinal hernia of the ovary but this was changed to cystic tumor of the round ligament. The mass was the size of a pigeon egg, and gave no symptoms except pain during menstruation. The tumor was found to be so intimately connected with the right round ligament that the anterior portion of the ligament formed the posterior wall of the cyst. Maccabruni[12] brings out the fact that the tumor was formed of only one layer while the ovarian dermoids are formed of either two or three layers. As all extra-peritoneal dermoids spring from one layer he points out that it is probable this tumor arose from the ectodermic layer and progressed inwards invloving the round ligament secondarily.

The cysts and hydroceles of the round ligament may well be considered together as they both comprise a collection of fluid in the canal of Nuck. The hydrocele of the round ligament is not classified by Emanuel[4] as a distinct tumor development because it develops in the canal of Nuck and not from the tissues of the round ligament itself. The explanation of this process is clarified by a review of the anatomy[13] of the round ligament. The two round ligaments are rounded cords between four or five inches in length, situated between the layers of the broad ligaments in front of the Fallopian tubes. This ligament passes forward, upward and outward through the internal abdominal ring along the inguinal canal to the labia majora, in which it becomes lost. It consists principally of muscle tissue extending from the uterus, also of some fibrous and areolar tissue besides blood vessels and nerves enclosed in a duplicature of peritoneum in the form of a tubular process, for a short distance into the inguinal canal. This process is called the canal of Nuck. It is generally obliterated in the adult but sometimes remains patent even in advanced life.

The cystic affections of the round ligament are very apt to present more diagnostic difficulties than the tumors that have previously been considered. Tumors arising from the intraperitoneal portion of the round ligament may attain considerable size before giving rise to any symptoms and even then it would be very difficult to differentiate absolutely this condition from many types of pelvic tumors as the clinical picture is usually the same. In the early stage any affection of the extraperitoneal portion of the ligament is frequently mistaken for a hernia and very often these cases are fitted with a truss. Some authors feel that the wearing of a truss stimulates the growth of these tumors. The cysts and hydroceles of the round ligament are more difficult to differentiate from a hernia than are the hard, firm tumors.

In 1916 Hines[14] reported a cyst of the right round ligament. The patient noticed a swelling in the right groin and she complained of increasing tenderness in the mass. Examination showed a slightly fluctuating swelling, protruding from the external ring, which gave some tenderness on pressure. There was no cough impulse nor was there any signs of inflammation such as might be expected in acute adenitis or abscess. There was no intestinal symptoms suggestive of interference with the fecal current and no history of trauma. A tentative diagnosis was made of an encysted omentocele. At operation the tumor was found to fill the lower part of the inguinal canal and projected for some distance beyond the external ring. Hines believes that the cyst was due to an accumulation of fluid in the lower end of the canal of Nuck which may have been persistent through its entirety at one time and subsequently closed at some point in the inguinal canal. A very similar case is reported by Johnson[15] and at operation a hydrocele of the round ligament was found.

When the tumors or growths become larger and give rise to pressure symptoms with a dragging sensation and radiating pains down the legs

the difficulties of diagnosis are very much eleviated.

A diagnosis of any round ligament affection should be sufficient for us to advise operative measures. In the first place these small, apparently innocent nodules may in a short time develop to considerable size and in addition to causing the patient many troublesome symptoms the surgical removal becomes difficult. In the second place we know that the most common tumor of the round ligament is the fibromyoma and these tumors may at any time undergo a malignant change.

My interest in the affections of the round ligament was stimulated by the following case:

Miss L. P. came under my observation June 5, 1922. She is single, eighteen years of age, a student, and lives at home under very good conditions. Mother and father are living and well; two brothers also living and well. One sister died at the age of twenty from sarcoma of the uterus. Aside from minor ailments as a child the patient states that she was well until the Spring of 1921. At that time she suffered an attack of pain in the upper left chest anteriorly. This was accompanied by dyspnea. This lasted off and on until June of the same year, though it was never severe enough to keep her home from school. Her family physician made a diagnosis of dry pleurisy. In the Spring of 1922 this condition returned and affected the lower left chest anteriorly and laterally. She states that she still notices some slight discomfort in this region, especially on coughing. At the present time the patient complains of a swelling in both inguinal regions. On coughing there is pain across the lower part of the abdomen and in both inguinal regions. There is also dysuria and malaise. Menstruation is regular; duration five days; moderate flow; no pain. Last menstruation was May 10, 1922.

In March, 1921, she noticed a swelling in the left inguinal region. This was about one and one-half inches in diameter, soft, not tender and disappeared on pressure. There was no discoloration. This mass gradually increased in size. In March, 1922, she noticed a swelling in the right inguinal region. This likewise was about one and one-half inches in diameter and similar in all respects to the mass on the left side. It seemed to be increasing in size at about the same rate as the left side. About a year after the appearance of the mass on the left side she noticed pain in the inguinal regions and across the lower part of the abdomen when she coughed. This was the first discomfort she had experienced. In March, 1922, at the time the mass on the right side became evident, she was fitted with a truss with a pad on each side. About this time a marked dysuria developed. This consisted of a dull aching pain which occurred just at the completion of the act of voiding and lasted for two or three minutes. This pain was located in the lower abdomen and was more especially felt in the swellings in the inguinal regions. This pain was so severe that she had to assume a bent position for relief. This pain has persisted to the present time and has neither increased nor decreased in severity. Patient states that for the past few months she has tired more easily and she feels under par.

Physical examination.—The patient is a well developed and well nourished female but appears somewhat anemic. Weight 140 pounds. Temperature normal. Pulse 86. Systolic blood pressure 108; diastolic 72. Head and neck normal. Lungs show no areas of dulliness and there is a normal respiratory murmur throughout. Heart not enlarged. No murmurs. Abdomen is flat. No scars. No areas of tenderness. No masses palpated. Rectal examination revealed the uterus in anterior position, movable, not enlarged. No masses or tenderness found in the adnexal regions. Examination of the inguinal regions showed the external rings to be relaxed and large. On inserting the finger into the canal a fullness was found that could not be completely reduced. When patient coughed a slight impulse was felt. When patient stood up a mass presented at both external rings. These masses were soft, not tender, and could be reduced into the canal. The mass on the left side was about a third larger than the one on the right side. Urine examination negative. Blood normal. A diagnosis was made of bilateral inguinal hernia with probable involvement of the bladder. Operation was advised.

Operation June 6, 1922, at the Ancker Hospital under local anesthesia. The right side was operated upon first. The usual incision for repair of an inguinal hernia was made. When the inguinal canal was opened a soft, apparently cystic mass was encountered. It extended to the external ring and was not reducible. The distal portion of the mass was first freed and the dissection carried upward. There were places where the wall was very thin and the cavity of the mass was opened at one point where it was densely adherent to the floor of the canal. The opening was immediately closed but a small amount of straw colored fluid escaped. When the mass was entirely freed it was found to lead to the internal ring. The peritoneum was located and was apparently normal and not involved in the pathologic process. The mass was then clamped at its lower limit and removed. The wound was closed in layers with cat gut sutures. There was some doubt in our minds as to the exact condition with which we were dealing and considering the possibility of a vesicle diverticulum a small soft rubber drain was introduced extending below the fascia. The left side was then operated upon and the same condition was found and was treated in the same way. An indwelling catheter was placed in the bladder. As soon as the examination of the removed specimens revealed the fact that no bladder tissue was present the indwelling catheter and drains were removed. Convalescence was uneventful and patient was discharged from the hospital June 19, 1922.

Pathological Report.—The specimens of tissue removed from the right and left inguinal canals consist of two cyst-like sacs with an outer rough layer and an inner smooth shining serous layer. These were

opened at one end and measured 7 × 3 and 9 × 4 cm., respectively. The walls are of variable thickness, ranging from 1 mm. to 3 mm. and appear transparent in the thinnest portions. Cross section shows the left to be multilocular and the right to be unilocular. The lumen is filled with a yellow, gelatinous material. The inner lining is smooth and shining but is thrown into irregular folds, is dark red in color and studded by minute yellowish nodules varying from 1 mm. to 2 mm. in diameter. These are firm in consistency and quite typical of miliary tubercles. Microscopic section shows the walls to consist of connective tissue carrying many blood vessels which are dilated and filled with blood. There are also a number of small hemorrhages into this tissue, and the occasional appearance of a few smooth muscle fibers. Scattered throughout are numerous tubercles characterized by endothelioid cells, giant cells and a rich infiltration with lymphocytes.

Diagnosis.—Tuberculous serous cysts.

After considering all the findings in the case a post-operative diagnosis was made of tuberculous hydrocele of both round ligaments. The two most important conditions forming a cystic tumor in this locality to be considered were adenomyoma and hydrocele of the round ligament. The pathological examination furnishes no evidence of an adenomyoma but it does show a cystile mass whose wall is formed by serous membrane. Such a finding in this region points at once to an accumulation of fluid in the canal of Nuck. The writer believes that in this case the canal of Nuck has remained patent and later became closed at some point in the inguinal canal and the incidence of the tuberculous infection at this point resulted in the development of the tuberculous hydroceles. It is impossible to determine the origin of this infection but the most reasonable presumption is that the attacks of pleurisy from which the patient suffered were due to a previous tuberculous infection which has since healed and become inactive. A most thorough search, both by physical examination and roentgen plates, failed to reveal any focus in the lungs. It is very probable that the primary focus was in the hilus and therefore difficult to demonstrate.

A very logical question arises as to the presence of any intra-abdominal tuberculosis which could have extended along this persistent peritoneal process. The patient has never had any disturbance or symptoms which a tuberculous infection of the pelvic organs, sufficient to give rise to such an advanced involvement as we have in this case, would produce. The patient undoubtedly would have had some symptoms directing our attention to this region and positive evidence would have been found on pelvic examination. The same facts apply to the question of a general abdominal tuberculosis. The peritoneum that was inspected at the internal ring, on both sides, at the time of operation was apparently perfectly normal. In an extensive search of the available literature I was unable to find any reference to the incidence of tuberculosis in connection with hydrocele of the round ligament. This is, then, as far as I am able to ascertain, the only case of tuberculous hydrocele of the round ligament to be reported.

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CASE REPORT

THE DIFFERENTIATION BETWEEN ACUTE APPENDICITIS AND ACUTE PROSTATITIS AND SEMINAL VESICULITIS*

REPORT OF TWO CASES

WILLIAM P. HERBST, M.D.
Minneapolis

I would not venture to estimate the number of male patients who have undergone appendectomy for acute prostatitis and seminal vesiculitis, but they make up a much larger group than most of us would care to admit. Inasmuch as I have seen two cases recently in which the appendix was suspected, I am bringing this subject before the Society.

Chronic prostatitis and seminal vesiculitis occur in some degree in about 30 per cent of all adult males, and in only about 60 per cent of these is there an antecedent history of gonorrhea. When one takes into consideration the number of cases in which gonorrhea is superimposed upon a previously existing prostatitis and seminal vesiculitis, a reasonable estimate of prostates and vesicles infected primarily by the hematogenous route would be about 70 per cent.

The more common causes of non-venereal prostatitis are infected teeth, infected tonsils, and infected nasal sinuses. Less frequently, but nevertheless a factor in some cases, is intercourse with individuals harboring pathogenic organisms in their cervical secretions.

The results of cultural studies made by von Lackum in 405 cases in which prostatic secretions were examined were as follows:

Sterile	35.25 per cent
Streptococci	35.25 per cent
Staphylococci	22.25 per cent
Other organisms	7.25 per cent

Of infected cases, streptococci constituted 55 per cent, staphylococci 33 per cent, and other organisms 12 per cent.

In determining the presence or absence of prostatitis, a most satisfactory procedure is to examine microscopically some of the prostatic secretion obtained after prostatic massage with the bladder empty. The failure to obtain secretion is indicative of pathology and not of the absence of pathology, as is so commonly thought.

The lighting up of these chronic prostatic and seminal vesicular infections into acute conditions occurs in a certain number of cases and often suggests acute appendicitis, as is shown in the two following case histories.

Case 1.—Mr. E. M., thirty-seven years of age, married thirteen years, had gonorrhea ten years ago. He had had frequent sore throat. Two months before I was called to cystoscope him for pyuria with fever and lower left abdominal pain, he had an acute throat infection which was followed by abdominal pain which varied in location and for which one doctor had recently (within the previous week) advised appendectomy. When I saw him his complaint was lower left abdominal pain with slight nausea. His temperature was 99.4 degrees; pus (grade 1) was present in the urine and some tenderness (for the past few hours) in the left epididymis. W.B.C., 35,000. There were no urinary symptoms. The tonsils were red and cryptic. There was moderate tenderness throughout the abdomen, but this was more marked in the left lower quadrant. The left epididymis was quite tender. The prostate was normal in size with multiple indurated areas, and was exquisitely tender. The left vesicle was more tender than the right, but both were normal in size and consistency. The prostatic secretion was practically pure pus. I did not cystoscope him on account of the acute epididymis and the comparatively small amount of pus in the urine.

Following a somewhat stormy course, which was ushered in by the interne giving 5 c.c. of a stock vaccine instead of 3 minims, the acute condition gradually subsided so that the patient left the hospital in eight days. His tonsils were removed about three weeks later and although he has not followed advice as to adequate treatment for his prostatitis, it was reduced to a Grade 1 infection with pusless urine without further local treatment. His treatment could not be handled satisfactorily owing to the fact that he is a traveling salesman.

Case 2.—Mr. L. C., twenty-five years of age, medical student, had had scarlet fever and diphtheria in childhood, and occasional attacks of tonsillitis each year. No history of gonorrheal infection.

The onset of the attack was sudden, with headache, malaise, fever and chill, temperature of 103.8 degrees, pulse 120, and slight abdominal discomfort. The W.B.C. count was 14,000. The urine was negative. The tonsils were moderate in size and injected.

The next day when I saw him he felt about the same, but the temperature had fallen to 99.4, and the leucocyte count was 25,000. The abdomen was negative except for a generalized sensation of discomfort. The prostate per rectum was normal in size and consistency. The vesicles were normal in size and consistency but were extremely tender, especially the right, and pressure here produced a very severe pain in the right lower quadrant. Secretion obtained contained pus (grade 3), and the urine contained pus (grade 1).

The condition continued as a mild general abdominal discomfort, with occasionally transient frequency, pyuria from grade 1 to 3, and with a gradually receding leucocyte count under urinary antiseptics and semi-ambulant regime. A cystoscopy was done to rule out

*Read before the Minneapolis Surgical Society, at its meeting of November 7, 1929.

a small *x*-ray shadow in the right lower pelvis as a possible stone, and to obtain definite information as to the source of the pus. The urine from both kidneys was negative, and that from the bladder contained pus (grade 1). The shadow in the *x*-rav was demonstrated to be extra-urinary by the right pyeloureterogram.

This condition continued about the same for the next three weeks. On one examination I found what I thought to be definite tenderness over the appendix, and felt that he might have an infected appendix in conjunction with his prostatitis and vesiculitis. He had his appendix out as an interval appendectomy, and it was described as a retrocecal congested appendix, but it gave no evidence of inflammation upon very careful microscopic examination of sections.

About three weeks later he had his tonsils removed as an aid in doing away with a probable etiological factor in his prostatitis and vesiculitis.

In conclusion I wish to call attention to the occurrence of a leucocytosis in these cases and to mention the part the tonsillar infection may have played. I wish also to urge rectal palpation and microscopic examination of the prostatic secretion in all patients whose clinical picture does not conform to the typical acute appendicitis sydrome, before appendectomy is performed.

SOME ENERGEN FOODS NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that a line of "Energen" products, marketed by the Energen Foods Co., Ltd., England (Energen Foods Co., Inc., New York), distributor), was presented for consideration as "starch reduced" foods containing "an increased amount of protein in the form of gluten" and recommended for use in the dietetic treatment of "Diabetes, Obesity, Gastric and Intestinal troubles, in which it is essential to decrease the amount of starchy food, and in all conditions of debility or malnutrition where an increase of proteins is necessary." The Council found many unwarranted claims and other objectionable statements in the submitted advertising material. When these were reported to the firm, it stated that some of this advertising is no longer in use even in England and most of it has not been circulated in the United States. Assurance, however, was given that the advertising matter to which objection had been made has been discontinued or that it will be. The firm requested reconsideration, particularly of Energen Bread, submitting further advertising. After considering the further evidence, the Council declared Energen Bread, together with Energen Bismeal, Energen Cocoa, Energen Digestive Biscuits, Energen Endobran Biscuits, Energen Gluten Semolina, Energen Gluten Tapioca, Energen Macaroni, Energen Pastry Flour, Energen Starch-Reduced Bread (Batons), Energen Starch-Reduced Bread with Casein (Batons), Energen Starch-Reduced Rolls, Energen Starch-Reduced Rusks, Energen Starch-Reduced Wheatmeal Bread (Batons), unacceptable for New and Non-official Remedies because they are unscientific mixtures marketed with unwarranted therapeutic claims under names not correctly descriptive of their composition and in a way to invite their ill advised use by the public. (Jour. A. M. A., August 3, 1929, p. 381.)

THE TWENTY-FIFTH ANNIVERSARY OF THE COUNCIL ON PHARMACY AND CHEMISTRY

At a meeting held February 3, 1905, the Board of Trustees of the American Medical Association created an advisory board to be known as the Council on Pharmacy and Chemistry. The organization of this Council was perfected on February 11, 1905. Thus the Council on Pharmacy and Chemistry passes the twenty-fifth year of its organization and continues, in a second quarter century, one of the most notable works for scientific medicine ever accomplished by any organized group. It is significant that several of the original members of the body have maintained their connection since its inception and that the secretary, W. A. Puckner, has rendered continuous service as a full-time officer for the body from the first. The Council could not have achieved what it has, without the support of the medical profession of our country. Thus, with the establishment of the Council, the advertising of medicinal preparations in the Journal of the American Medical Association was limited to those products that had been passed by the Council. The same rule has applied to the other publications of the Association, and finally every state medical journal, except those of Illinois and New York, followed this lead. A considerable number of journals not controlled by medical societies also give their support to the Council's work. The medical profession must support the Council or its work will be futile. The members of the Council serve without remuneration and The Journal of the American Medical Association tenders to them the thanks and appreciation of the profession that they have so well served. (Jour. A. M. A., February 8, 1930, p. 413.)

President's Letter

PROBABLY the greatest need today of the rank and file of the medical profession is contact with each other, because contact brings an exchange of experiences and ideas. This stirs latent memories, inspires new interest in one's work, fosters good fellowship, promotes tolerance and respect for each other, teaches us to know our own shortcomings and to recognize the sterling worth of our professional neighbors.

Wherever men with common interests and purposes gather together to learn from each other, they soon discover that petty differences which had once kept them apart lose their magnitude in a new perspective or completely vanish amid the bigger and better things born of the collective search for knowledge. Surely it is permissible in this connection to quote from the Presidential Address by William Osler before the Medical and Chirurgical Faculty of Maryland: "No class of men needs friction so much as physicians; no class gets less. The daily round of the busy practitioner tends to develop an egotism of a most intense kind, to which there is no antidote. The few setbacks are forgotten, the mistakes are often buried, and ten years of successful work tend to make a man touchy, dogmatic, intolerant of correction, and abominably self centered. To this mental attitude the medical society is the best corrective, and a man misses a good part of his education who does not get knocked about a bit by his colleagues in discussions and criticisms."

A masterly expression is it not? But it applies to a considerable number of us, in the cities as well as in the country. Where it applies in the cities it is a greater reproach, for there contact is easily had with one's fellows. Whereas in the rural districts the doctors serving an extensive territory may be so widely scattered that, despite good roads and autos, a real sacrifice may be suffered in getting together. Yet the sacrifice is more than compensated by the resulting mutual understanding of each others problems, both social and scientific. It has been said that every doctor is known to be a thoroughly good fellow by everybody else except another doctor. If that be so then we doctors are allowing some very small personal envies and jealousies to cheat us out of the greatest of kindly sympathies, companionships and friendships that our poor human society has to offer.

The next meeting of the state society will be held July 14, 15 and 16 in Duluth.* The secretaries and presidents of the component societies can render their members a valuable service by persuading them to attend this meeting. Moreover the councillors, committee chairmen and officers of the state body wish to meet as many of the members as possible. They wish to talk over our common problems. They wish to learn at first hand what the men are thinking, what they want, how they think we can render our organization more serviceable both scientifically and socially.

S. H. Boyer

President,
Minnesota State Medical Association.

*REMEMBER THE DATE

EDITORIAL

MINNESOTA MEDICINE

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ARE THE STATE DUES EXCESSIVE?

We are all concerned about the high cost of living. The question, however, of keeping expenditures within the limits of income resolves itself in most instances into the use of judgment in the matter of expenditures. The sum total of money foolishly spent by people in general is appalling. We physicians both individually and sometimes collectively are not exceptions in this respect.

The question has been raised in various quarters whether the money being spent by our State Association (and the yearly total has shown a marked upward trend in recent years) is being wisely expended. The Council of the State Association is the financial body of our organization and authorizes the expenditure of the income of the Association which for the most part consists of the dues voted by the House of Delegates. We members therefore, through our self-assessment have made possible the rather considerable sum available the past three years. The House of Delegates, realizing the need for more funds if the proposed program of expansion was to be carried out, voted the increase of state dues to $15.00 effective in 1927. Some members have begrudgingly paid the dues, but apparently few if any have given up their membership on account of the dues, judging from the membership roll, for in 1929 our membership was the largest in history.

Now just what has been accomplished with the $15.00 membership?

In the first place we have a real organization and a secretary in Dr. E. A. Meyerding who has not only the ability but the time to devote to Association affairs. We have a long list of committees that have been conscientious in tending to their duties and have undoubtedly been more efficient because of the aid given them by the organization in general and the secretary in particular.

The committee which has accomplished the most and naturally has spent the most, has been the Legislative Committee. Not one man in a thousand could or would have done the work that Dr. Herman Johnson has done with the legislature the past few years. And what has this committee accomplished? The prevention of undesirable legislation is usually the major part of legislative accomplishment and when it comes to legislation affecting medical affairs there has been no exception. Almost yearly the wild reformers calling themselves anti-vaccinationists and anti-vivisectionists have to be combatted; the establishment of new cults prevented; and the extension of the rights of medical cults already licensed has to be curtailed.

In 1925 this committee obtained a reduction in the statute of limitations from six to two

years to conform to the statutes in force in most of the other states of the union. The long period of six years has been responsible for the high incidence of malpractice suits in Minnesota which had reached such a point that one insurance company operating in the state was about to materially increase its rates. The yearly saving to physicians in this state has undoubtedly amounted to more than the full amount of our present state dues.

The Basic Science Law went into effect May 1, 1927. Since that time but two chiropractors and only twenty-one osteopaths have passed the Basic Science examinations, while during the five preceding years an average of forty-three chiropractors were yearly licensed in Minnesota. Fifty-one osteopaths were licensed during the six year period prior to this act. The law has apparently had the desired effect of barring the unqualified from becoming licensed in this state in the future.

The revision of the Medical Practice Act in 1927 effected certain needed changes in the old law. The yearly fee for registration of physicians has furnished the means of enforcement and that this means has been utilized is shown by the report of the investigating attorney that in less than two years ninety-eight cases have been investigated and twenty-seven cases brought into court with twenty-three convictions.

If it had not been for the legislative committee tax supported hospitals would have been opened to the medical cults; the laboratory of the Venereal Division of the State Board of Health would probably have been discontinued and a limit would have been placed by law on medical fees coming under the Industrial Commission.

The next most expensive committee of the Association has been the one on Public Health Education. The activities of this committee have been so diversified and its influence has been exerted in so many directions that the results are less tangible. They undoubtedly are nevertheless far reaching. The efforts of this committee have been to foster medical influence in the direction of the various health organizations in the state. This has been accomplished in part through county society committees on Public Health, by assisting health organizations in putting on approved programs and by assisting the Minnesota Public Health Association in the preparation of its publications and otherwise. Weekly newspaper service has been conducted throughout the state and radio talks have been furnished.

One of the worthwhile undertakings of the Association which should be mentioned is the Consultation Bureau conducted by Dr. W. A. O'Brien in Minnesota Medicine. The county secretaries' conference has been made possible by the increase in dues and the annual meeting is no small item of expense.

While we do not approve of extravagant expenditures by the State Association the above recital seems to substantiate the view that there has been value received. The whole question is whether we are to continue to be an organization which through its various agencies is going to make its influence felt, or whether the State Association is to revert back to its former condition of innocuous desuetude.

SCHOOLS FOR TECHNICIANS

The demand for X-ray and laboratory technicians has opened a new and attractive field, especially to young women with high school education and even in some instances to those with college degrees. The training of these technicians has presented certain problems which so far have not been solved.

The Council of Medical Education and Hospitals of the A. M. A. has investigated laboratories all over the country and has published a list of the laboratories they have approved as satisfying certain minimum requirements. Our University has in operation a four year course for the training of technicians. The real problem lies in the existence of laboratories which furnish poor training for technicians. Some of these institutions have been established by lay individuals, have no hospital connection and have therefore no methods of obtaining laboratory material for instruction, have a faculty composed of technicians or poorly qualified physicians, and are purely commercial enterprises. High pressure advertising methods are used and extravagant or dishonest claims made as to the kind of instruction furnished and the high salaried jobs awaiting graduates. Glowing accounts are given by field agents to groups of high school students in an effort to swell the enrollment of the school.

The present unsatisfactory situation was brought up in the House of Delegates at the last

State Medical meeting. The opinion was expressed that the State Association should take some steps to prevent the continuation of these humbug institutions in our state. The proposal that a committee of the State Association should issue certificates to technicians who had received proper training was wisely rejected when it was brought out that the State Association after issuance of such a certificate would not be in a position to use disciplinary measures if necessary. A State Committee on Schools for Laboratory Technicians was however appointed to investigate the situation and report at the next meeting.

This is a matter with which our Legislative Committee will doubtless be concerned as a bill was introduced in the last legislature proposing to regulate these technical schools. It failed to pass on account of certain technicalities, but is likely to be resubmitted at the next legislature. As Dr. Morris Fishbein stated at our last state meeting, there doubtless should be some legislative provision for the chartering of such schools. Just how this control should be exerted is a matter that deserves some consideration.

There is no question but that the director of an *x*-ray or medical laboratory which trains technicians should possess the background of a medical training. Isolated laboratory reports are dangerous. The supervision of laboratory training by an M. D. is also important in order to instill the proper viewpoint in the undergraduate mind. It goes without saying that the physician in charge should be in good standing in the medical profession.

PROTECTING CHILDREN FROM TUBERCULOSIS

The month of April has again been chosen by the National Tuberculosis Association for its annual prevention campaign. The above title is this year's slogan and a good one it is, for if the infants and children of today can be protected from the infection until adult age is reached a major problem in the anti-tuberculosis campaign will be solved.

Students of tuberculosis have changed somewhat their interpretation of the course of tuberculous infection. Many patients suffering from tuberculosis give a history of exposure to the infection in infancy and childhood with good health until early adult life is reached. On the other hand in many instances of adult tuberculosis the exposure is never traced. While most adult tuberculosis is the result of an infection early in life, an appreciable percentage of cases undoubtedly acquire the infection after the age of twenty.

From a practical standpoint the protection of infants and children from infection is a most important procedure in a prevention campaign. It is only through publicity measures that progress in this line can be made, and even though reiteration of the seriousness of the disease is likely to bring out neurotic tendencies in those so disposed, the campaign must be pushed.

The public is gradually being impressed with the potential seriousness of a chronic cough. Grandpa with his hacking cough is persuaded to be examined. The cigarette cough may not be as harmless as supposed. The affectionate friend who insists on kissing children and on the mouth too is most unpopular with the young mother of today—and rightly so.

A pamphlet entitled "Childhood Types of Tuberculosis" just made available by the National Tuberculosis Association and which can be obtained from the Minnesota Public Health Association is a gem. It contains a rather reliable answer to the prevalence of tuberculosis in this country. An analysis of 51,000 school children below high-school age in cities and towns in Massachusetts showed that 28 per cent reacted to the tuberculin test; 1.5 per cent had childhood types of tuberculosis, and 3.4 per cent were classed as suspicious. The blanket statement that we all become infected with tuberculosis at some time or another is obviously erroneous.

One word of warning should, however, be uttered. The pamphlet mentioned states that "calcified lesions in children, however, indicate tuberculous disease." This statement, we feel sure, is not in accordance with the opinion of all authorities on this subject. Certainly the physician who is unfamiliar with the appearance of the *x*-ray of a normal child's chest has no right to cause unnecessary anguish on the part of a mother by a too ready diagnosis of pulmonary tuberculosis from an *x*-ray plate of the chest alone. Calcified glands at the hilus in a chest *x*-ray of a child with a positive tuberculin test may be the result of a tuberculous infection, but

it should be kept in mind that the shadow of a bronchus at the hilus may simulate a calcified gland. *X*-ray diagnosis of active pulmonary tuberculosis (requiring treatment) is in general an unsafe procedure, and this statement applies to early infancy and childhood.

ASSOCIATE EDITOR

The Journal has been very fortunate in having had the services of Dr. Frederick W. Schlutz, Chief of the Pediatric Department of theMedical School, as associate editor for the past five years. He has had charge of the Progress Section of the journal, a department which should be of considerable interest to our readers, although conducted on a small scale as compared with the corresponding department in certain other journals. This department in Minnesota Medicine deserves more attention on the part of physicians throughout the state and it seems necessary from time to time to call attention to the fact that abstracts of current literature by members of the association are always welcome. Those interested are urged to get in touch with the nearest department head so as to avoid duplication.

With the departure this month of Dr. Schlutz to Chicago, his place will be taken by Dr. Lewis M. Daniel of Minneapolis. Dr. Daniel has been the editor of the new Hennepin County Bulletin and has kindly consented to assist with the editing of Minnesota Medicine. Heads of the various sections should submit abstracts directly to Dr. Daniel, 1853 Medical Arts Building, Minneapolis.

T-A YIELDS SUBSTANTIAL RETURNS IN YONKERS

From January 1, 1926, to January 1, 1930, 20,538 children in the city of Yonkers were immunized against diphtheria. This resulted in a large reduction both in incidence and mortality, the former decreasing from 431 in 1927 to 66 in 1929, and the latter from 23 to 5 during the same period. Because of this diphtheria prevention work there was a marked decrease in the number of diphtheria cases treated at the Communicable Disease Hospital during 1929, resulting in a reduction in the amount spent by the hospital during the year of approximately $7,500.

The anticipated saving during 1930 over the amount spent during 1929 has been estimated at $9,400.

—*Health News,* Feb. 3, 1930.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

GRANITE FALLS WOMAN GIVEN JAIL SENTENCE FOR VIOLATING BASIC SCIENCE LAW

Marie Pederson, forty-two years of age, residing at Granite Falls, Minnesota, entered a plea of guilty to practicing healing without a basic science certificate.

Mrs. Pederson has been at Granite Falls intermittently for the past four years. She maintained an office in her living quarters on the East side of the river in Chippewa County. She was popularly referred to as the "Iodine Nurse." Several complaints were made to the State Board of Medical Examiners in reference to this defendant. After an investigation by Mr. Brist on behalf of the Board, she was arrested and entered a plea of guilty. The Court sentenced the defendant to a term of 90 days in the Chippewa County jail, and placed the defendant on probation upon the condition that the defendant absolutely refrain from practicing healing in this State. The defendant's home is at Brandt, South Dakota.

Before sentencing the defendant, Judge Baker exacted a promise from the defendant concerning her conduct in the future, and made it very plain that she would serve every day of her sentence if she attempted to practice in this State in the future.

MINNEAPOLIS WOMAN CONVICTED OF VIOLATING BASIC SCIENCE LAW

Mrs. Kathyrn Albers, 2527 Hennepin Avenue, Minneapolis, went on trial February 10, 1930, before a jury in the Court of the Honorable Gunnar Nordbye on a charge of practicing healing without a basic science certificate. The testimony disclosed that Mrs. Albers was using electrical appliances in giving treatments. Her defense was that she was exempted from the basic science law because she gave "mental and spiritual treatments."

The Court ruled, however, that the kind of treatments given by the defendant was a question of fact for the jury, and after deliberating only twenty minutes, the jury returned a verdict of guilty.

On February 13 Judge Nordbye sentenced the defendant to six months in the workhouse, and placed her on probation for one year. The defendant was given thirty days from that date in which to dispose of her equipment and get out of the business.

In event she does not comply with the order of the Court, the defendant will have to serve her workhouse sentence.

Judge Nordbye gave the jury a very splendid charge, and instructed them that the case was a very important one from the standpoint of the people in this State, and deserved the most serious consideration on the part of the jury.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of April will be as follows:

April 2—Cancer Cures
April 9—White *vs.* Brown Bread
April 16—Safeguarding Motherhood
April 23—Code of Medical Ethics
April 30—Inflammation of Mastoid Bone

MINNEAPOLIS SURGICAL SOCIETY

Dr. A. T. Mann was elected president of the Minneapolis Surgical Society at the annual meeting held in March. He succeeds Dr. S. R. Maxeiner. Dr. Theodore Sweetser was named vice-president to succeed Dr. M. J. Lynch. Dr. H. O. McPheeters was re-elected to the position of secretary and treasurer.

Dr. J. M. Hayes was named to serve on the advisory committee for five years, while Dr. Owen Wagensteen was elected for four years to fill the unexpired term of Dr. Sweetser. Other members of the council are: Drs. R. C. Webb, W. D. White, E. Robitshek and S. R. Maxeiner.

MINNESOTA STATE MEDICAL ASSOCIATION

DULUTH MEETING

"The best scientific program in the history of the organization is in preparation for the Sixty-second Annual Meeting of the Minnesota State Medical Association," President S. H. Boyer announced following the final meeting of the Committee on Scientific Assembly, March 22.

The meeting will be held in Duluth July 14, 15 and 16. A series of vitally important subjects will be discussed and a distinguished group of visiting celebrities will be present to make it a program no medical man can afford to miss.

It is expected that Dr. Volhartt of Germany and Dr. W. T. Longcope, professor of medicine, Johns Hopkins, will be present. They are scheduled to talk on diseases of the kidney.

The symposium on early carcinoma, one of the livest subjects before the medical profession today, will have W. J. Mayo, F. A. Figi and Waltman Walters of Rochester, and Leo Rigler and O. J. Campbell of Minneapolis to lead the discussion.

The symposia on Traumatic Surgery, Immunology, Rheumatic Fever and Anesthesia, scheduled also, will have equally distinguished attention.

The scientific aspect of the meeting will conclude with the symposium on Therapy led by such men as E. C. Davidson of Detroit on the "Treatment of Burns in Children," and R. S. Dixon, also of Detroit, on the "Treatment of Gonorrhea in the Female."

In response to a large number of requests the committee has arranged to present the Canti Cancer Film again as well as other new films of scientific interest.

Space does not permit full details of the important scientific program. But every member of the Association will look forward to the early publication of the complete printed program.

The first business session of the meeting is that of the Council scheduled for Sunday night, July 13, with the House of Delegates convening Monday. Medical fraternities and alumni associations of the University of Minnesota are planning meetings to coincide with this session.

Trends in modern medicine, where they are leading and what they hold in store for the regular practitioner will be discussed Monday night by Olin West, secretary of the American Medical Association; J. G. Crownhart, secretary of the Wisconsin State Medical Association; W. J. Burns, secretary of the Wayne County, Michigan, Medical Society; Paul Fesler, superintendent of the University Hospital; N. S. MacDonald, U. S. Veterans Bureau, and Mrs. F. L. Adair.

The banquet scheduled for Tuesday night will have W. A. O'Brien, University of Minnesota, for toastmaster. President Boyer announces that he hopes to have all living past presidents of the Association present at a special table for this occasion which is to be devoted to a good time for everybody with little, if any, speaking.

W. A. Coventry of Duluth, in charge of the local committees on arrangement, has appointed many subcommittees to look after the welfare of members and their wives. Arrangements for the Women's Auxiliary are in the hands of Mrs. F. W. Spicer and Mrs. B. F. Davis. Duluth members announce that they expect to make this the most delightful as well as the most interesting meeting in the history of the Association.

VITAMIN D IN TUBERCULOSIS

A recent investigation of the role of vitamin D in the management of tuberculosis indicated that the administration of viosterol did not produce any detectable acceleration of the healing process. These observations suggest that such value as cod liver oil possesses in tuberculosis does not depend on its relatively high concentration of vitamin D. These studies emphasize the fact that cod liver oil possesses more than one claim to nutritive value, for it is even richer in vitamin A than in the antirachitic factor. In spite of the enormous antirachitic potency of viosterol, this material is by no means to be regarded as therapeutically equivalent to cod liver oil. (Jour. A. M. A., February 8, 1930, p. 414.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Medical Science in the Soviet

Available information on the state of socialized medicine in Russia shows a curious picture of a progressive idealism on the one hand and bitter class feeling on the other.

The apparent result is a large and ostensibly progressive organization for care of the sick resting upon an entirely inferior, unsuitably selected and badly educated medical profession.

Whether that is the inevitable result of socialized medicine or of the particular bitterness with which the professions are held in Soviet Russia, the reader is left to guess.

Dr. Ralph Reynolds, retired president of the American Medical Association in Vienna, visited a large number of clinics in Moscow and Leningrad recently.

He told the New York Herald-Tribune on his return that all Soviet workers are insured so as to provide medical care as well as full wages while they are sick.

Night sanatoriums for workers who are in poor physical condition in which the worker gets special diet and exercises and treatment if he needs them are flourishing. There are twenty-four of them in Moscow, ten for tuberculosis suspects. There are also 156 day nurseries, most of them located near the factories where the mothers are employed. Large numbers of physicians are on duty night and day at the public clinics. And there is ample provision and equipment for research.

On the other hand, all physicians are employed by the government and at a considerably lower wage than that paid the sovereign worker of the Soviet. This latter-day aristocrat will no longer hear of well paid professions which give the doctor or the lawyer a better home than he is able to earn.

Consequently even the best paid doctor seldom earns more than 100 dollars a month and is obliged to live accordingly, and a generally inferior class of students is entering the medical schools. In spite of the funds lavished by the government on equipment and instruments, scientific research inevitably leaves much to be desired, too.

The American doctor obviously looked with suspicion upon a system which manned even the most up-to-date and well equipped public health systems with inferior, badly educated and under-paid physicians.

An interview with the Grand Duke Alexander of Russia, published recently in the Illinois Medical Journal, affords another interesting, though possibly biased slant on the social state of things in Soviet Russia.

The grand duke's quarrel with the Soviet is not political, he insists. He is the present tenth in succession to the throne of the Romanoffs but declares that if by any strange hazard the ancient Romanoff power should be put in his hands, he would immediately deposit it in a Russian republic.

His quarrel is with the social teachings of that curious, half legendary revolutionary figure, Madame Kollontai.

"How many of you here in the United States know the truth or half the truth about the 'reforms of Russia'? Such reforms as teach little girls who should yet be learning their prayers that the sex act and its consequences need not worry them?

"What have we in Russia? Little girls, some of them as young as eight and ten years, openly having connections with men and knowing even at that age that the right of abortion is as free and easy as the right to drink water!"

This state of affairs he lays at the door of Kollontai and warns Americans of hidden germs of the same teachings in much of the proposed first aid to mothers and children legislation in the United States.

It is interesting to note that this exiled Russian of the ancient aristocracy has three sons employed in this country, one as a bond salesman in New York; another as a department store clerk in Chicago; a third engaged in aviation manufacture. The duke, himself, lectures occasionally, upon the romantic vicissitudes of his life.

OF GENERAL INTEREST

Dr. Arthur Strachauer, Minneapolis, has resigned as Director of the Cancer Institute at the University. He retains his title as Professor of Surgery in the Medical School.

Miss Marion Vannier has resigned as Director of the School of Nursing at the University Medical School, effective September 1, 1930. Her successor has not yet been appointed.

Dr. Royal C. Gray of the University of Minnesota, Department of Mental and Nervous Diseases, left the latter part of March for Boston, where he will do post graduate work in the Boston Psychopathic Hospital.

Dr. Arthur Garbrecht, formerly associated with the Earl Clinic, Saint Paul, upon his return from post graduate study in Vienna in November, opened an office for general practice at 1035 Lowry Medical Arts Building.

Dr. Hugh Cabot, dean of the Medical School of the University of Michigan since 1921, will become Senior Consultant in Surgery at the Mayo Clinic, June first. Dr. Cabot was formerly professor of surgery at the Harvard Medical School.

Dr. Kano Ikeda took charge of the laboratories at the Charles T. Miller Hospital, Saint Paul, the first of the year, when he severed his connections with St. Luke's Hospital. He had been pathologist at St. Luke's Hospital for more than three years.

Dr. Harold Stratte, class of 1920, University of Minnesota, formerly of Hallock, Minnesota, has become associated with Dr. L. Sogge at Windom. Dr. Ellsworth Johnson of Windom begins a fellowship in radiology at the Mayo Clinic, April first. He formerly was associated with Dr. Sogge.

Dr. A. E. Flagstad, who until recently was associated with Drs. Chatterton and Von der Weyer, was recently appointed Deputy Coroner in Minneapolis. He maintains offices at 1549 Medical Arts Building, Minneapolis, and at 218 Lowry Medical Arts Building, in Saint Paul, for the practice of orthopedics.

Dr. Tressa Moran assumed charge of the laboratories at St. Luke's Hospital, Saint Paul, March first, coming to Saint Paul from Waterloo, Iowa. Dr. Moran received her medical degree at the Loyola Medical School, Chicago, and for a time was at the Mercy Hospital at Iowa City, and later pathologist and X-ray supervisor at the Allen Memorial Hospital, Waterloo, Iowa.

The fourth annual prize of $250.00 will be awarded this year by the Minnesota Society of Internal Medicine to the practicing Minnesota physician, not a member of the Society, who is deemed most worthy to receive a prize in research in clinical medicine. Inquiries and theses should be submitted to the Chairman of the Committee, Dr. E. T. F. Richards, Hamm Building, Saint Paul, before October 1, 1930.

The International Medical Club was formed in New York City a few years ago in order to promote contact between the graduates of foreign medical schools residing in this country and American medicine. Foreign language medical societies in New York City include a Spanish, German, Russian, Hungarian, Greek, Celtic and two Italian societies. Heretofore there has been no relationship between them. This item is published so that foreign medical graduates or American physicians interested may join the club. Dr. Richard Kovacs, 223 East 68th Street, New York City, is secretary.

EFEDRON HART NASAL JELLY

EfeDronN Hart Nasal Jelly is another one of the ever increasing ephedrine proprietaries. The preparation is made by the Hart Drug Corporation, Miami, Florida. According to the label the formula is: Ephedrine hydrochloride Gr. 1; Chlorbutanol Gr. 2 1/4; Sodium Chloride Gr. 2 1/4; Menthol Gr. 3; Phenol Gr. 2; Oil of cinnamon Gr. 0.08; Jelly base q. s. ad drachms 5. The preparation has not been accepted for New and Nonofficial Remedies. While physicians' samples of this product have been liberally distributed, the carton is one which seemingly is addressed to the public as well. (Jour. A.M.A., February 8, 1930, p. 430.)

ANTISTREPTOCOCCUS SERUM OMITTED FROM N.N.R.

The Council on Pharmacy and Chemistry reports that for some years it has been questioning the value of antistreptococcus serum preparations. In 1928 the Council decided that unless new and favorable evidence became available, all streptococcus serum preparations would be omitted from New and Nonofficial Remedies with the close of 1929. Since no such new evidence has become available, the Council has omitted all antistreptococcus serum preparations as follows: Antistreptococcic Serum (Gilliland Laboratories, Inc.); Antistreptococcic Serum, Polyvalent (Lederle Antitoxin Laboratories); Antistreptococcic Serum (Eli Lilly & Co.); Antistreptococcic Serum, Purified and Concentrated (Lilly); Antistreptococcic Serum, Polyvalent (H. K. Mulford Co.); Antistreptococcic Serum (National Drug Co.); Antistreptococcic Serum (Parke, Davis & Co.); Antistreptococcic Serum-Squibb. (Jour. A.M.A., February 15, 1930, p. 484.)

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—Please explain the technic used in convalescent serum prophylaxis for measles.

Answer.—Withdraw from 10 to 100 c.c. of blood, depending upon the condition of the donor, the fifth day the measles patient is afebrile. Centrifuge the blood, separate the serum from the clot, and keep the serum in an icebox. The serum is said to last up to two years, although this is doubtful. Citrated blood may be used if the blood is not to be kept too long.

If passive immunity is desired, make one injection of serum into the anterior thigh muscles five days after exposure. From seven to twelve c.c. are used, depending upon the age of the patient. If you wish to take advantage of the patient's own production of antibodies and run the risk of producing a mild or modified measles with more lasting immunity, the injection is made on the tenth day after exposure.

The indications are institutional practice, epidemic of virulent measles and protection of exposed children in a family which has come in contact with measles. This is often done when the exposed children are not well.

2. *Question.*—What is the most likely diagnosis and treatment for our patient who has the following history: Female, 54, married, came to us for examination because of severe backache and pain radiating down the right thigh to the knee with some weakness in the right lower extremity. Severe backache has been present for the past six or seven weeks and the pain in the thigh for about four weeks. She also complained of neuralgia in the right side of her neck, which extends from the ear down to the front of her neck. She had lost some weight but did not know how much. Mother died of cancer at seventy-five. Patient's gall-bladder was removed about seven years ago. Has had severe backache at intervals since then. Four years ago she was seen by a physician because of the backache. An *x*-ray examination was reported as negative, and she was given a brace. She has had seven children, with no difficulty during pregnancy or delivery. Passed the climacteric three years ago. There has been no history of any pelvic disorder. When first seen, physical examination was negative except for definite tenderness along the right sciatic nerve from the hip to the knee. Hyperextension caused moderate pain, and there was also a definite tenderness of the right sacroiliac joint. She looked rather pale, and there was evidence of weight loss. Blood pressure 125/75. A tentative diagnosis of sciatic neuritis was made, and she was sent to the hospital for observation and treatment.

Since that time the pain has become more severe and is now bilateral. She has developed a prominence in the region of the eleventh and twelfth thoracic vertebræ. She had also developed a mass over the upper sternum, which has reached the size of a small orange. It is quite firm and apparently arises from the bone, as it is firmly fixed to it. Pelvic examination shows some tenderness under the abdominal wall in the midline. Laboratory: hemoglobin 84 per cent (Sahli), erythrocyte count 4,300,000, leukocyte count 3,900. Urine shows a few pus cells; red cells have never been present. X-ray examination shows a destructive lesion in the tenth thoracic, first, second, and third lumbar bodies, a mass in the mediastinum, and elevation of both sides of the diaphragm.

Answer.—Differential diagnosis is between Hodgkin's disease and metastatic carcinoma. Ewing's tumor (endothelioma) should also be considered as it involves bone, lymph nodes, and viscera. An absolute differential diagnosis can be made by excising the small piece of tissue from the sternal tumor. A search should also be made for a possible primary carcinoma. Sometimes a very small breast tumor will give metastases such as you have described. In any event, deep *x*-ray treatments should be given if the patient's condition justifies it. These treatments will probably relieve the pain and temporarily halt the progress of the disease, but the outcome will probably be lethal.

3. *Question.*—I have a patient, a seventeen year old boy, who hurt his knee two weeks ago while playing basketball. He states that he "did not come down right on the knee." Pain following the injury was only slight and the swelling not very great. He has been unable to completely extend the leg, and up to the present time has shown no improvement. X-ray plates show a partial separation of the spine of the tibia. Will you please advise me as to the diagnosis and treatment of this condition, as I have been unable to find anything about it in my textbooks.

Answer.—The most probable diagnosis is a shearing injury of the spines of the tibia. A search should be made for previous disease or injury in the bone. Tuberculosis is also another possibility, but it probably can be ruled out from your history and description of the lesion. Another possibility should be considered; that is, that the lesion is an old one and that the recent injury either aggravated it or brought it to the attention of the patient. Laceration of the crucial ligaments usually accompanies this form of trauma. An attempt should be made to find out if there is any displacement of the tibia. Grasp the leg above and below the knee and try to elicit displacement. Forward displacement will probably indicate that the posterior ligament is involved while posterior displacement usually points to involvement of the anterior ligament. Please let us know if displacement is present, and we will advise you as to the future treatment. If no displacement is present, conservative treatment will probably be all that is needed.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of February 19, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 19, 1930, having been postponed one week on account of the meeting of the American College of Physicians. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. Emil S. Geist. There were 38 members and 1 visitor present.

Minutes of the January meeting were read and approved. A Committee consisting of Drs. Freeman, Foley, and S. E. Sweitzer was appointed by the President to draw up a memorial of Dr. Paul B. Cook.

The scientific program of the evening consisted of two theses and a case report, as follows:

Dr. Albert G. Schulze, St. Paul, read his thesis entitled "A Plea for the Radical Treatment of Incomplete Abortion."

DISCUSSION

Dr. John F. Noble (St. Paul) (by invitation): The curettings from the cases which Dr. Schulze has described were sent to the Ancker Hospital Laboratory for examination. They were described grossly and microscopically and this decription was filed with the charts. The data which he has cited was taken from these reports. No clinical histories were available with the specimens so that, in the few cases where a diagnosis of acute or chronic endometritis was made, only endometrium was found in the specimens and this endometrium contained acute or chronic inflammatory cells with no products of conception present to confirm the clinical diagnosis of incomplete abortion.

I do not believe that the division of these cases into two groups, clean and infected, on the basis of the presence or absence of inflammatory cells is sound. The very nature of incomplete abortion makes the presence of necrotic tissue a common finding and the necrotic material sets up an inflammatory reaction in the uterus which cannot be separated microscopically from bacterial inflammation, and in those instances where large amounts of material were removed from the uterus, only small blocks of tissue were examined and other areas might have shown leukocytes. I think my reports have misled Dr. Schulze in this matter.

Practically the only method by which a pathologist can judge the value of a therapeutic measure of this type is by the mortality rate. The fact that Dr. Schulze has treated 235 consecutive cases without a death speaks for itself. When I went to the Ancker Hospital about five years ago and these specimens began to appear in the laboratory, I fully expected to be called upon to autopsy some of them, but as time went on and no deaths occurred, I came to the conclusion that at least in his hands it was a satisfactory method of treatment.

From a pathological standpoint, there are two things to consider when a curettage of an incomplete abortion is contemplated. In the first place a curette is bound to break down the natural defensive reaction in the uterine wall against infection, and to open up channels for infection, but in thoroughly removing necrotic tissue which is an excellent culture media, the danger of infection is reduced. This is undoubtedly desirable. The question then is simply: What is the least harmful method of removing placental and decidual remnants from the uterus?

I would like to ask Dr. Schulze whether or not any of these cases were criminal abortions.

Dr. J. L. Rothrock (St. Paul): I was very much interested in Dr. Schulze's paper, especially his plan of treatment.

I had hoped he would say something about abortion in the various stages of pregnancy up to four months. It seems he evidently has dealt principally with abortions of early pregnancy. We are liable to fall into error in attempting to apply a stereotyped plan of treatment to all cases, and here, as elsewhere, I believe it a safer plan to meet indications existing.

I, too, have had a considerable experience in the treatment of incomplete abortions. Formerly, two or more decades ago, it was the almost universal practice decided that the abortion was inevitable. In applying this plan indiscriminately to all manner of cases, unpleasant consequences sometimes followed, especially in infected cases, and it is not always possible to tell in advance whether infection is present or not. For that reason I have long since adopted more conservative measures. My plan of treatment was usually this: If the abortion seemed inevitable, and the cervix was undilated, and if considerable hemorrhage was taking place, a gauze pack was firmly placed in the vaginal vault around the cervix and the patient was then given quinin or ergot and, in many instances, within 8 to 12 hours on removal of the pack, the contents of the uterus would be expelled or be protruding from the dilated cervix and could easily be removed with a forceps without invading the uterine cavity. If not, the cervix would be found sufficiently dilated to admit a finger and the uterine cavity could be explored and any adherent or retained membranes could easily be removed, often without any anesthetic. Other cases, which, on account of hemorrhage, demanded prompt relief, were of course curetted.

I think the objections and difficulties, mentioned by Dr. Schulze, to digital removal of retained portions of placenta and membranes are theoretical and in my experience have not been met. My experience in this respect has been identical with Dr. Williams', so admirably expressed in his textbook.

One of the surprising things in early abortion is the comparative freedom from fatality on account of hemorrhage; I have never known a case of fatal hemorrhage in an early abortion, and Hofmeier quotes Alfred Hegar as stating that in more than 40 years' experience he could recall no case that died from hemorrhage following abortion in early pregnancy. In the recommendation of the curette, its dangers must not be lost sight of. If the uterus is soft, it is easily perforated, perhaps without much risk to the patient, but

still a potential risk. A too thorough curettage of the recently pregnant uterus may remove so much of the endometrium that scars are left and if the patient becomes pregnant again there may be an adherent placenta.

Furthermore, the curette is not so certain a method of removing all of the placental tissue. To be convinced of this one has only to make a digital examination following a curettage to note how much placental tissue has been left behind. Another disadvantage of curettage is that the curette stimulates the normal rhythmic contraction of the uterus to an exaggerated degree and my experience has been the loss of much more blood during curettage than where the placenta is removed with the finger.

The general consensus of opinion is that the curette may be dangerous in infected cases, causing a rapid extension by opening up new avenues favoring extension.

The highly favorable outcome in this series is undoubtedly due in a large measure to Dr. Schulze's skill in the use of the curette, but the thought occurs to me that in this series he was dealing almost entirely with uninfected cases, or at least not with hemolytic streptococcus infections.

Dr. Arnold Schwyzer (St. Paul): Dr. Schulze has had excellent results. However, he made the statement at the end of the paper that the use of a sharp curette is a safe procedure. I don't think that it is right to make such a broad statement to be followed by every practitioner. I will refer to one case I saw when still an assistant in the Women's Hospital of Zurich. The chief assistant was curetting a woman and I was assisting him. He got out a lot of material, a lot of white bands, and it seemed queer that so much material could come out. I then remarked to him, "This is muscle." He had scraped out much of the uterine muscular tissue. She had fierce bleeding and was packed. When the packing was removed in about two days, the bleeding started again and we had to pack again, and after this a third time. Then the case seemed all right. But what happened later on I do not know. So, if one says that a sharp curette is a safe thing, this is stating too much. In skilled hands like Dr. Schulze's he has shown that it is all right; but to give that out as holding good for every doctor, is a dangerous thing. Furthermore, I don't think it is often necessary to insert the whole hand into the vagina to palpate the uterine cavity with one finger as Dr. Schulze stated. A sharp curette, especially in the later months, can do a great deal of damage. You do not need to get every shred at once; small particles will come away with the packing.

I would like to say here that a good number of years ago Professor Chlumsky published a paper in which he told of the value of a phenol-camphor mixture. When carbolic acid crystals and camphor crystals are put together they melt into a clear fluid. He used 30 per cent of carbolic acid and 60 per cent camphor, and the rest alcohol to make up 100. This is an exceedingly strong, non-cauterizing, antiseptic solution, and we moisten the gauze with this. You can leave it in for three days and it comes out still smelling sweet.

To return to the objection I raised: With a sharp instrument you might curette out the muscular coat; if not careful this possibility should be reckoned with. If we never had heard of this danger and did not watch what we scrape out, we would be liable to do much damage even if we do not perforate the uterus.

Dr. H. B. Sweetser (Minneapolis): While listening to Dr. Schulze's paper, I said to myself, "In the hands of an expert, like Dr. Schulze, possibly it is safe to use a sharp curette, but in the hands of the general practitioner, to whom many of these cases come, both in hospitals and in homes, I feel sure that such a procedure will result in disaster if not a few cases."

Twice, in my experience, I have had to resect coils of bowel which were pulled down through a perforation of the uterus under the mistaken impression that they were secundines. The wall of the pregnant or recently pregnant uterus is very soft and relaxed, and it requires a very educated tactile sensibility, especially when applied through a sharp curette, to determine that the curette is gliding along the wall and not through it. Therefore, I think it would be a dangerous thing to send out a report of this kind, showing such good results in the hands of an expert.

Dr. H. T. Nippert (St. Paul): When I started out as a country practitioner in St. Paul about 37 years ago when you could not get a patient to a hospital, I had more abortions than confinements the first few years. I used to go in, but not with a sharp curette. I used a dull curette and would clean out as much as I could and then went in with the finger and frequently had to go in again as I found after digital examination there were still some pieces of placental tissue or membranes left. A great many I emptied with only the index finger. One case especially comes to my mind. I had put the patient across the bed and soaked a few towels in bichloride of mercury solution and put over her abdomen and thighs. When I was curetting her the curette suddenly went in up to the handle and I said "that has gone through the uterus." On each visit afterwards I was afraid something would show up but nothing did. I feel like Dr. Schwyzer, if a woman is pregnant three or four months, I would wait and see what happened but if early in pregnancy I would go in with a dull curette. I have never seen any mishap nor had any bad results from it. Now things are done much more simply and antiseptically in the hospital. Even in private homes I would do it with the dull curette and think we would get along just as well.

Dr. R. T. LaVake (Minneapolis): The importance of this subject demands a full and free discussion. My experience leads me to practice and advocate the conservative treatment of incomplete abortions. A survey of literature leads me to believe that it is the opinion of the great majority that the conservative treatment is the treatment of choice.

Dr. Schulze has outlined in his interesting paper his reasons for having changed from his advocacy of conservative treatment to his advocacy of radical treatment with the sharp curette. It is instructive, but quite

disturbing to any positive attitude of assurance on any subject, to contemplate the widely different conclusions that can be drawn from the same cold facts and figures. To my mind, the facts and figures in Dr. Schulze's stimulating paper show what can be done with a sharp curette and not what should be done or advocated.

Conservative treatment of this condition implies noninterference except upon the indication of profound or protracted bleeding, or for the possible drainage of pus collections. In private practice most abortions are not induced and in these cases my experience convinces me that 9 out of 10 are so complete that routine intervention of any kind may be classed as meddlesome and unnecessary. In a general hospital a greater percentage of abortions prove to have been induced and a greater percentage will need interferenc at some period in their treatment. This is a point that I did not hear mentioned in this paper.

When profuse or extended bleeding points to the possible advisability of interference, to my mind each abortion should be considered as potentially infected until one can be reasonably sure that it is not, by the temperature, leukocyte and differential counts and, possibly, by the sedimentation test if doubt still prevails. Temperature alone, as a criterion of safety, is not sufficient. If it is an infected case, one can visualize the infected area as surrounded by a protective leukocytic barrier that must not be broken down, if avoidable, by any form of intervention. In any case, when intervention is definitely indicated, I deem the finger to be the safest instrument. If the finger proves to be inadequate, the next safest instrument is the largest dull curette that can be inserted. Even this should be used with the greatest caution. The larger the curette, the less likely is the danger of perforation. Although many of us have been lucky enough not to have perforated a uterus with a curette, most of see at least one perforation a year, and our turn is to be expected. Very few men of large experience have not perforated a uterus.

In my opinion the sharp curette should be used mostly as a diagnostic instrument, and should be used as a curative agent only when infection has been as nearly definitely excluded as possible and when the condition is found to be other than an incomplete abortion. Even then the sharp curette is not without danger, as I have learned from bitter experience in cases where, under the best conditions of surroundings, supervision and technic, the most alarming results of infection have followed a simple diagnostic curettage.

From the standpoint of relative safety, the number of days one should wait before intervention after the temperature, leukocyte count and sedimentation test have been normal, no one so far as I know can state with any degree of assurance. Personally I would rather have an interval of over a week than under a week, if the scant loss of blood warrants the delay.

Dr. Frank Wright (Minneapolis): I would like to ask how a man is to become expert in the use of the sharp curette if he does not begin to use it until he is expert.

Dr. C. M. Carlaw (Minneapolis): Why use the curette at all? In the early 90's at the old Asbury Hospital I curetted one of these cases with a sharp curette and the first think I knew I was tickling the umbilicus. I became very much alarmed and when I saw Dr. Dunsmoor in the hall outside of the operating room I told him what I had done. He said that so long as I did not pull down a loop of intestine it was all right. That case did teach me not to use the sharp curette. I think in most cases that need curetting, completing the dilatation with a Goodell dilator and working with a sponge holder you can with safety empty the uterus and then instead of the curette, roll gauze around a uterine forcep and with this, curette the inside of the uterus by rotating it around in a corkscrew action. You will be surprised how easily and thoroughly you can polish the inside of the uterus with this sponge curette. Follow this cleaning by swabbing out the uterine cavity with Skene's solution of iodin and then clean up the parts with alcohol. You will find the bleeding will stop, the uterus will contract, the temperature will drop and the patient will rapidly get well.

Dr. J. F. Hammond (St. Paul): I think the discussion about the curette can be applied to any instrument. The scalpel is a very dangerous instrument if not used properly. I think the curette can be put in the same class. In the majority of cases, particularly in abortions before the third month, the simplest way to empty the uterus is with the curette. I quite agree with what the speaker has said about infection. I was brought up on the radical treatment, if you wish to call it that, and in the maternity hospital where I was in 1906-07 our attempt was to empty every uterus as quickly as possible. At that time Williams was preaching the use of the finger. If one or two fingers could not be inserted through the cervix we were told to incise the cervix, but that always seemed to me to be a radical procedure. As a matter of fact we never carried that out. The difficulty I had with the use of the finger was that I could not be sure that I was removing everything. So I think in early abortion, where you have decided there are no contra-indications and no infection going on, the uterus can be emptied in a conservative way by using the curette. I don't think one need use a sharp curette. It is very easy to put any curette through the uterus. Dr. Nippert's remarks remind me of Dr. Chipman, who always impressed on the students the necessity of care in the use of the curette. He once asked one of the students what he would do if the curette went through the uterus. The student said he would pull it back.

Dr. LaVake said that, if you wait, 9 out of 10 will not need any interference. That is true, but they will have a very long convalescence. After the first 3 or 4 months I think the simplest way to do is to pack the cervix and allow the uterus to expel the contents. As Dr. Rothrock has said, you will likely find the ovum in the vagina in 48 hours. In infected cases I think it is well to wait until the temperature is normal. There is another class of cases where it is urgently necessary to interfere—where the patient is bleeding and infected.

I have had two cases where that condition existed. They were losing a lot of blood and were definitely infected. The question arose as to what would be conservative treatment. In those two cases I felt that the safer way would be to do a hysterectomy and I did it. That can be condemned too and it has been done, but those two cases recovered. One has to be up against a case before he can decide just what to do. I think Dr. Schulze's management of these cases has been very good. I had previously thought he followed or advocated never touching the uterus in these cases but I see he does not believe in allowing his cases to go on indefinitely.

Dr. Schulze (in closing): I do not wish to create the impression that I curette everything. All of this work was done in my service at the Ancker Hospital where we are obliged to take whatever comes.

There are three groups of cases where we follow a waiting policy. The first group include those women generally three months pregnant or more who very likely have had a complete miscarriage instead of incomplete. We give them the benefit of the doubt and our further treatment is dependent on their clinical course. The second group include those women who are running a temperature. Here we are obliged to wait, as such a patient is not a good surgical risk. The third group include those women who, although they have no temperature, have been criminally aborted. These women are potentially infected. It is always permissible to remove plugs of placental tissue from the cervix.

Dr. Noble asked if any of these were cases of criminal abortions. To this I would reply that my estimate would be that about one-third of them are.

Dr. Rothrock inquired about the stage of pregnancy. The majority of these cases were in the first trimester. We had one case which proved fatal from the anemia following the tremendous loss of blood, but this case was not curetted.

Dr. LaVake stated the facts very aptly when he said that each man follows the method which he likes best and my preference in the matter is set forth in my paper. It is difficult to state who has become skilled in curetting a uterus, but any one who undertakes it should be careful. Dr. LaVake's choice is one of noninterference because he feels that by waiting his patients will not require interference; but other factors must be considered. How long do these patients bleed? How much do they bleed? How long are they in the hospital? Are you not exposing these patients to possible infection? I am guided by my results, which I feel have been very good.

Dr. Martin Nordland (Minneapolis) read his thesis entitled "The Larynx as Related to Surgery of the Thyroid, Based on an Anatomical Study." Numerous lantern slides were shown.

DISCUSSION

Dr. Gustav Schwyzer (Minneapolis): Even if a surgeon doing thyroidectomies cannot regard all the finer ramifications of the nerves, nevertheless it is very important and imperative that he knows the exact course of the nerves in his field of operation.

Dr. Nordland has shown us a number of beautiful pictures reproducing anatomical dissections he has done recently at the University of Minnesota. His work concerns in particular the superior and inferior (recurrent) laryngeal nerves. Both are cervical branches of the vagus. The vagus itself coming from the brain through the foramen jugulare forms a thickening shortly after leaving the skull and this is called the ganglion nodosum. This ganglion receives motoric fibers from the 11th and 12th cerebral nerves, the accessorius and the hypoglossus. Thus we have in this ganglion sensory and motoric fibres. That the superior laryngeal nerve in its external branch carries motoric fibers has been known to us for a long time. We know that the cricothyroid muscle, a muscle which is destined to tense the vocal cords, and the pharyngeal inferior constrictor muscle are innervated by the external branch of the superior laryngeal nerve. The pharyngeal muscles are playing an important part in the phonation.

The very special points that Dr. Nordland brings out concern the internal ramus of the superior laryngeal nerve. In a beautiful specimen of a resected larynx he shows us that a number of branches of this internal ramus of the superior laryngeal nerve goes into the interarytenoid muscle. This work corroborates the work of others.

For years we have practiced a method of ligating the entire upper horn instead of only the blood vessel running into the same. This procedure undoubtedly safeguards the superior laryngeal nerve and avoids paralysis of the cricothyroid muscle. In spite of this method, however, I remember we had cases of temporary hoarseness, the phenomenon explained here tonight. The condition just brought to our attention should not be confused with a paralysis of the vocal cords by injury to the recurrent nerve.

DeQuervain's method of ligating the inferior thyroid artery is of decided advantage. It ligates this artery at its trunk and not only one of its branches. It causes remarkable hemostasis which is striking in bleeding toxic goiters, and finally it means the safety of the recurrent laryngeal nerve, because the ligation takes place quite a bit farther out at the point where the inferior thyroid artery comes and makes a curve from beneath the common carotid.

In cases of recurring goiter, particularly in toxic goiter where we have to operate again, it is my belief that the method of ligating the inferior artery as mentioned above is liable to bring on injury to the recurrent laryngeal nerve because of the distorted anatomy. For this reason I do not consider this procedure a very safe method when operating on recurring goiter cases.

I wish to thank Dr. Nordland in the name of Academy for his interesting pictures of the anatomical dissections he has shown us tonight.

Dr. A. E. Benjamin (Minneapolis): I am pleased to have seen this presentation. It gives us a more vivid idea of the arterial, venous and nerve supply of the thyroid area. A number of years ago I did some dissecting in this region to determine what was the best

procedure in thyroid surgery, and after witnessing operations in various parts of the United States and Europe, I decided that thyroid surgery had been made too difficult and with too much effort on the part of the operator. I then began more or less mass control by using the clamp, endeavoring to clamp the blood vessels and capsule of the upper pole and the gland tissue below, including the branches of the inferior thyroid. I then found that thyroid surgery was very easy in the majority of cases because the hemostasis was almost perfect. I always use plain catgut. I had no trouble, no hoarseness resulting, and so far have not included any nerve structure, although that may have been good luck. At any rate, this plan has obviated any of the unfortunate results in the work. I found it unnecessary to ligate every branch but dissected out the diseased portions of the lobes, then passed the sutures back and forth through the capsule and any of the gland that was left. In this way I then had a pretty clean field all the time. It has been very satisfactory. I have not yet had the boldness in many cases to ligate the artery beyond the fascia, thinking perhaps it might be that, if I disturbed the blood supply of the remaining gland tissue too much, I might have some unfortunate results.

Dr. H. A. H. Bouman (Minneapolis): I rise to say that I have listened to Dr. Nordland's thesis not only with profit but with great pleasure and a feeling of gratitude, having known him when he was a very young man in our section of the city.

Some microscopical studies have also been made of late to determine the nature of these nerves. The vagus is not a compact cable, but is composed of numerous bundles held loosely together by connective tissue. On cross section in the neck region various kinds of fibers are seen. Some have heavy, some delicate medullary sheaths and fewer are bare axis cylinders. The laryngei carry by far the most fibers with heavy sheaths; indeed, the recurres seems to be made up almost entirely of these fibers, which are motor.

Regarding the ligature of the inferior thyroid, Kocher taught to tie this vessel at exactly the same place, but he did not separate the muscles to reach it before exposing the goiter, as Dr. Nordland has practiced.

Dr. Nordland (in closing): I want to thank the gentlemen for their discussion of my paper. I have nothing of importance to add. I did not intend to discuss the various advantages of the ligature of the inferior thyroid artery, according to deQuervain. The point I want to stress is that it is occasionally necessary to ligate this vessel, and, when it is, I believe the anatomical factors indicate that it is an advantage to ligate it according to this method.

Dr. A. R. Hall (St. Paul) gave a report of "Abnormal Subclavian Arteries" and showed *x*-ray films. (To be reported later.)

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

NEW AND NON-OFFICIAL REMEDIES

The following article has been accepted by the Council on Pharmacy and Chemistry.

United States Standard Products Co.

Diphtheria Toxin-Antitoxin Mixture 0.1 L+ (Non-Sensitizing) Prepared from Sheep Serum.

The following articles have been exampted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1929, p. 481):

Robert McNeil

Tincture Digitalis Duo-Test McNeil

Black Capsules Digitalis Duo-Test McNeil

TRUTH ABOUT MEDICINES

Meads Viosterol In Oil 100 D.—A brand of viosterol in oil 100 D, N.N.R. (Jour. A. M. A., August 31, 1929, p. 693). Mead Johnson & Co., Evansville, Ind.

Lenigallol-Zinc Ointment. — It contains lenigallol (Jour. A. M. A., April 6, 1929, p. 1181) 6 per cent in a base composed of zinc oxide ointment-U.S.P. E. Bilhuber, Inc., New York.

Typho - Serobacterin - Mulford (Sensitized Typhoid Vaccine) (New and Non-official Remedies, 1929, p. 384).—This product is also marketed in packages of three syringes, being three immunizing doses. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., February 1, 1930, p. 339).

FOODS

The following products have been accepted as conforming to the rules of the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association. These products are approved for advertising in the publications of the American Medical Association, and for general promulgation to the public.

Junket (The Junket Folks, Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.).—To prepare the product the dried blown or dried salted rennets in ordinary salt brine is extracted. The enzyme is then precipitated by salting the saturation and the resulting precipitate is mixed with pure Worcester salt, dried and pressed into tablets. Flavored Junket consists of rennet powder, similar to that used for Junket Tablets, except that this is mixed with cane sugar and natural flavoring. While the rennin enzyme itself does not add to the fuel value of milk, it makes it more wholesome because of its digestive action on the milk.

Spintrate (Spinach Concentrate) (Spinach Products Co., Inc., Norfolk, Va.).—Spinach in the form of a fine powder made from fresh spinach of the Savoy or curly leaf type. Spintrate is an excellent source of food iron, calcium, and phosphorus; it is also a rich source of vitamin A, B (B_1) and G (B_2).

Whitefield Genuine Grapefruit Juice (Whitefield Citrus Corporation, Long Island City, N. Y.).—This is pure undiluted juice of sun-ripened grapefruit and contains no added preservatives. The process of manufacture preserves the original character of the juice.

Whitefield Genuine Orange Butter (Whitefield Citrus

Corporation, Long Island City, N. Y.).—This is an orange preserve with a new and different flavor and consistency made from tree-ripened fruit.

Aunt Jemima Pancake Flour (The Quaker Oats Co., Chicago).—The product is a mixture of four flours—wheat, corn, rye, rice—with sugar, milk, baking powder and salt.

Aunt Jemima Buckwheat, Corn and Wheat Flour (The Quaker Oats Co., Chicago).—This is a buckwheat corn and wheat flour.

Quaker Crackels (The Quaker Oats Co., Chicago).—This is composed of corn, wheat and oats.

Quaker Quick Macaroni (The Quaker Oats Co., Chicago).—This is a new-type macaroni. A milk containing macaroni that cooks in five minutes instead of twenty. (Jour. A. M. A., February 8, 1930, p. 411).

Bordens Evaporated Milk (The Borden Co., New York City).—It has the following average composition: fat, 7.85%; protein, 6.88%; carbohydrates, 9.67%; ash, 1.55%; total solids, 25.95%; water, 74.05%. The product is manufactured from whole milk. Borden's Evaporated Milk is advertised for infant feeding and for household use in making milk convenient for cooking. It is claimed that the milk is clean and sterile; that it resembles breast milk in ease of digestion; and that it produces fine flocculent curds.

Cream of Wheat (Cream of Wheat Co., Minneapolis).—It is a product made entirely from wheat. It consists of the endosperm of the wheat, with only so much of the bran and germ as it is impossible to remove. The product is used because it is rich in energy content and easily digested.

Gerber's Strained Vegetable Products (Gerber Products Division, Fremont Canning Co., Fremont, Mich.).—Brands: Gerber's Strained Spinach, Strained Carrots, Strained Green Beans, Strained Peas, Strained Prunes, Strained Tomatoes and Strained Vegetable Soup. Specially selected vegetables, steam pressure cooked and sterilized at high temperature. It is claimed that by excluding air and cooking under steam pressure without water, a greater conservation of mineral salts and vitamin elements is effected.

The New Pettijohn's (The Quaker Oats Co., Chicago).—This product consists of the whole wheat grain. It is obtained by steaming and flaking wheat which has a tender bran, the bran being included in unground form. The product contains all the nutritive elements of whole wheat.

Post's Bran Flakes with other parts of Wheat (Postum Co., Inc., Battle Creek, Mich.).—The product is composed of bran flakes with other parts of wheat, flavored with malt syrup and salt. It combines the advantages of wheat bran in a nourishing and appetizing food. (Jour. A. M. A., February 15, 1930, p. 485.)

Muffets (Irradiated) (The Quaker Oats Co., Chicago).—Whole wheat, cooked, crushed, drawn out to filmy ribbon of wheaten threads. Wound round and round, baked and toasted. Muffets (Irradiated) makes vitamin D available in a breakfast food for all ages except infants. It is not intended as a therapeutic agent to supplant cod liver oil.

Quaker Farina (Irradiated) (The Quaker Oats Co., Chicago).—Farina passed under the rays of ultraviolet lamps until it acquires vitamin D. The product will improve calcium and phosphorus retention. It holds its irradiation under extreme conditions of cooking and storing.

Quaker Puffed Rice (The Quaker Oats Co., Chicago).—This product consists of rice kernels puffed to eight times normal size, providing for easy assimilation and retaining important food elements.

Quaker Milk Spaghetti (The Quaker Oats Co., Chicago).—The product is made from whole milk and wheat. (Jour. A. M. A., February 22, 1930, p. 559).

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
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THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

TUBERCULOSIS IN PUBLIC SCHOOL CHILDREN: Opie, H. R. Landis, McPhedran and Hetherington (Amer. Rev. of Tuberc., 1929, XX, 413). Sanatorium treatment gives children with manifest tuberculosis the best chance for recovery.

A certain number of children acquire serious tuberculous infection unaccompanied by physical signs or symptoms which, unless checked, will become clinical tuberculosis.

In the present study an attempt is made to apply the knowledge of latent tuberculosis that has been acquired by investigation of the spread of tuberculosis in families to the recognition and control of tuberculosis in schools.

About 800 white pupils and about 800 colored pupils in Philadelphia schools were studied.

To detect advanced latent tuberculosis, the tuberculin reaction and *x*-ray examinations were found useful. A history of contact with tuberculosis was often difficult to obtain.

The following are some of the types of advanced

latent tuberculous infection found: 1. Tuberculosis of tracheobronchial lymph nodes. 2. Tuberculous infiltration of the lung, of the childhood type. 3. Apical lesions of the adult type occurring in children, 12 to 18 years of age. The tuberculin test performed on 4,000 children showed that tuberculous infection is now scarcely less frequent in Philadelphia than in the cities of Europe 20 years ago.

Severe infiltrating lesions were remarkably prevalent in adolescent girls.

Manifest disease was found four times as often in adolescent colored children as in white children of the same age.

Prophylactic care controlled by repeated physical and roentgenological examinations furnishes a means by which advanced latent infection may be arrested before it has developed into clinically manifest disease. Children with the following conditions should receive special care in nutrition-tuberculosis classes or by some other regimen adapted to their needs, and they are suitable for admission to a preventorium if it is available:

(1) Manifest pulmonary tuberculosis with no symptoms, physical signs or roentgenological evidence indicating that the lesion is active. Sputum, if present, must be demonstrated to be free from tubercle bacilli.

(2) Latent apical tuberculosis.

(3) Latent tuberculous infiltration of the lung often associated with tuberculosis of tracheobronchial lymph nodes. In some instances, particularly in older children, these lesions are the scars of preëxisting infection.

(4) Tuberculosis of tracheobronchial lymph nodes, even though partly calcified (a) when the child is still in contact with open tuberculosis; (b) when the reaction to tuberculin is unusually intense; (c) when the lesions are unusually large or very numerous; (d) when they are associated with evidence of impaired health perhaps not referable to tuberculosis and including advanced underweight.

The study of the contagion of tuberculosis in families exposed to open tuberculosis has shown that children with the lesions just described are liable to develop manifest disease, but it is not assumed that the foregoing groups include all of the children who will develop manifest tuberculosis.

The following types of tuberculous infection are widely prevalent among healthy children and do not require special care:

(1) Infection demonstrated by a positive tuberculin reaction without lesion demonstrable by roentgenological examination even though there is contact with open tuberculosis. (Repeated examination are, however, essential for all children in contact with open tuberculosis.)

(2) Circumscribed nodules in the lung substance that have undergone calcification.

(3) Roentgenologically demonstrable tuberculosis of tracheobronchial lymph nodes that are partly calcified, except under the conditions outlined above. Sharply defined, very opaque lesions are likely to be healed or healing.

A. T. Laird, M.D.

SURGERY

SUPERVISORS:
DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

PRIMARY CARCINOMA OF THE URETER—REPORT OF A CASE AND A REVIEW OF THE LITERATURE: Louis M. Rousselot and John Daniel Lamon (Surg., Gynec. and Obstet., Vol. L., Jan., 1930, No. 1, 17-28). Rayer is given credit for having described the first case of this rare disease in 1841. Blatt collected forty cases from the literature in 1926. The authors review forty-eight cases collected from the literature and add a case report of their own, bringing the total up to forty-nine.

Men and women are afflicted in the same proportion. Sixty per cent of the cases occur in individuals over fifty years of age.

The outstanding symptoms are quite severe pain and hematuria; either of which occurred in all cases, and both of which occurred in over half of the cases. Other symptoms of urinary tract infection and irritation, and the sensation of a mass are much less common.

The direct diagnosis is suggested by the history of pain and hematuria and the presence of ureteral obstruction on ureteral catheterization with the *x*-ray films negative for stones in the urinary tract. A correct diagnosis was made or entertained in fourteen of the forty-nine cases. The differential diagnosis must exclude tumor of the kidney and renal stone.

The lesion is most often a papillary carcinoma. The non-papillary group include the squamous cell group, which probably arise from a metaplasia of the renal pelvis and ureter. The irritative action of stones has been involved by some as a factor in the metaplasia of the transitional epithelium of the kidney pelvis and ureter to a squamous cell type on the one hand, and as predisposing to carcinoma on the other hand. In only six cases were calculi present in the urinary tract. One of the outstanding sequelæ of prolonged ureteral obstruction is a hydronephrosis.

The prognosis is very grave; thirty patients dying while under treatment or within a few months. Among the remaining nineteen cases, one patient was well two and one-half years, and two other patients were symptom-free after one year.

The treatment of choice is uretero-nephrectomy.

Case report: A negro housewife of forty-eight years complained of constant pain in the left flank and left costo-vertebral angle, present for six weeks. She had also experienced night sweats, vomiting, distressing nocturia, and an increase in size of the abdomen. Examination revealed a feeble negress with a temperature of 101.2 and a pulse of 112. A large, hard, immovable tender mass was felt in the left upper quadrant. On

pelvic examination a large, smooth, round mass was palpated in the cul-de-sac, and which on cystoscopic examination was found to elevate the base of the bladder. *X*-ray examination of the abdomen was suggestive for stone shadows in the left kidney. The phenolsulphonephthalein output was five per cent in two hours. The blood urea was .81 mg. per litre of blood. The blood count revealed a moderate secondary anemia with a leukocytosis of 29,000. The urine contained a trace of albumin and pus cells. The patient died thirty-one days after the evacuation of the contents of a pelvic dermoid, running a progressively downhill course with a temperature of 99-101° F. At autopsy a benign dermoid surrounded by firm adhesions was found in the pelvis. A diffuse adenomyomatosis was present in the left tube. The left ureter was dilated to 0.5 cm. and contained small irregular elevated patches of tumor tissue in the upper 5.5 cm. of ureter. The midportion of the ureter presented a ureteritis cystica. The left kidney, enlarged to 17 x 13 x 10 cm., was composed of a multiloculated pyonephrotic sac containing two stones. The right ureter was dilated to 2.0 cm. and presented a ureteritis cystica and contained a large pointed stone completely occluding the ureter near the ureterovesical junction. The right kidney measured 16 x 10 x 9 cm. and its calyces and pelvis were extremely dilated. The tumor had invaded the left kidney and adjacent nerves; and metastases were present in the regional, perigastric and bronchial lymph nodes, adrenals, pancreas, liver, lungs and pleuræ. The tumor cells were of the squamous cell type with areas of prickle cells arranged in rounded islands or forming long finger-like processes dipping into the subjacent muscularis. The metastases resembled the parent tumor.

J. H. Rieniets, M.D.

TEMPORARY DIVERSION OF THE URINE BY PYELOSTOMY IN REPAIR OF THE URETER: Marc Iselin, Paris, France (Surg., Gynec. & Obstet., Oct., 1929, Vol. XLIX, No. 4, 503-509). The ultimate results of ureter reconstruction have been far from gratifying and it is almost a unanimous rule with French and German urologists that a kidney is lost after a ureter has been severed.

Ureters are usually injured during a pelvic operation. Poor results of the anastomosis; namely, stricture at the point of repair, hydro- or pyo-ureter, pyonephrosis, and perirenal infection, are, for the most part, due to the infectious nature of these operation, or because the surgical accident is not recognized at the time.

Obstruction occurs even in the absence of infection causing a hydro-ureter and pressure atrophy of the renal tissues. This process may be rapid or slow as shown by reports of cases up to twenty-seven years postoperatively, before the entire function was lost. However, Reed, Delbet, Brizaski, Friedrick, Bourniot, Rochet, Lenormant and Leibovici, Chifelian and Petit, have reported cases, followed over long periods of time, in which there was little or no renal impairment. With this evidence in hand it would be well to disregard the rule of most surgeons, who state that a nephrectomy should be performed in the case of a severed ureter, especially when one does not know the function of the remaining kidney.

The author considered stenosis as the cause of ureteral inertia and the resulting renal degeneration, and must therefore be prevented.

Traumatic lesions of the urethra resulted in stenosis (with few exceptions) before the use of cystostomy for diversion of the urine was used, since when, the results of urethral repair have greatly improved. Therefore the urine passing over the suture line must have something to do with the cicatrization and the author evolved the following technic:

Briefly: A pyelostomy performed and a bougie of sufficient size to fit the ureter snugly was introduced downward and held in place by a suture. A small catheter was placed in the pelvis (this was found to be useless later, as the fistula would remain open as long as the bougie was in place) and together with the short end of the bougie drawn out through the incision. A strip of gauze placed between the posterior edge of the kidney and the posterior abdominal wall (for 5 days) lessens infection.

Repair of ureter.—The end-to-end technic was used, being sure that all redundant mucosa was removed. The anastomosis was accomplished by four fine black silk sutures, using an eversion stitch and being sure that there was no mucosa between the muscle layers. With muscle to muscle and mucosa to mucosa quick regeneration occurs with a minimum amount of cicatrization.

Results.—The temporary pyelostomy remained open as long as the obstructing bougie was in place, but closed immediately upon its removal.

Peristalsis in the severed ureter was not hindered at the time of operation, but was absolutely inert after twenty-four hours and only a slight response in the distal portion. The proximal ureter continues to be inert although one animal showed some contractions by stimulation. The distal end showed intact peristalsis about one week alter.

If the anastomosis has been satisfactory and without stenosis, the contractions pass from one end of the ureter to the other without interruption at the end of seven weeks. Even with slight obstruction and ureteral dilatation strong contractions were observed.

In summary the author states that diversion of the urine permits cicatrization of the ureter without development of stenosis just as cystostomy checks the formation of traumatic stricture of the urethra. By preventing ureteral stenosis this procedure removes the cause of dilatation, atony, and finally complete renal atrophy.

L. G. Thomas, M.D.

CARCINOMA OF THE COLON—INTRAPERITONEAL VACCINATION BY MIXED VACCINE OF COLON BACILLI AND STREPTOCOCCI: Fred W. Rankin, and Arnold Bargen (Arch. of Surg., Vol. 19, No. 5, 906-914). Mortality statistics show the need of adopting useful methods to lower the death rate in this particular disease. The authors report the result of 60 cases between June 1 and November 6, 1928, in which intraperitoneal vaccine was used.

A majority of the patients reported received vaccine, the bacteria of which were isolated from patients who died of peritonitis. Vaccines were prepared separately of bacilli coli and streptococci and later a mixed suspension in sodium chloride was made with a density of about 1,000,000,000 organisms per cubic centimeter. Twenty-five hundredths of a c.c. of this vaccine made up to 1 c.c. with a physiological salt solution of sodium chloride was given subcutaneously one week before the anticipated date of operation. If no undue reaction occurred 1 c.c. of this vaccine in 10 c.c. of the solution was injected intraperitoneally the next day and a similar dose 2 days later. The patient was then given 2 days of rest and the operation was performed.

Reactions following intraperitoneal injections are similar, fairly severe, fever as high as 103.5 degrees F. within 2 to 4 hours after injections, diffuse abdominal soreness, some distension, occasional chills and leukocytosis. The reaction after the second intraperitoneal injection is lighter.

The mortality in the control group of 60 cases was 23 per cent; the mortality in the group which received intraperitoneal vaccine was 5 per cent.

The mortality lowering of 18 per cent, while it may not be enitrely attributed to the use of the vaccine, recommends it as a likely factor.

C. W. Mayo, Jr.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

THE NUTRITION OF HEALTHY AND SICK INFANTS AND CHILDREN. For physicians and students. E. Nobel, C. Pirquet, and R. Wagner, of the Children's Hospital of the University of Vienna. Second edition rev. with 78 illus. and 6 charts. Authorized translation by Benjamin M. Gasul. Price $3.50. Philadelphia: F. A. Davis Co., 1929.

Pirquet's Nem system was devised during the war period for the purpose of feeding large groups of individuals on an economical basis. This book represents the first attempt to introduce this system to the English-speaking physician. It involves the replacement of our comparatively simple caloric system by a new, rather involved, and sometimes weird nomenclature. (Ex. sacratama, socrutomo, etc.) We have found Schick's concept of dubo (whole milk plus 17 per cent cane sugar) the only practical application of this method. It is pleasant to note that the authors urge the use of dubo as a concentrated food and not for complementary purposes. American pediatricians may take exception to the authors' three-hour nursing schedule for all infants. American mothers may object to a nursing schedule lasting an entire year. The clinical consideration of nutritional disturbances originated long ago with Finkelstein and was stressed by Von Reuss in his classic text on "Diseases of New Born."

With the omission of the generally unfamiliar nomenclature, the book assumes a very elementary aspect. We do not think that the average practitioner will profit greatly by a study of this book.

D. M. Siperstein, M.D.

BERIBERI IN LATE INFANCY: THE RESULT OF CELIAC DISEASE. Sidney V. Haas, M.D., New York (Arch. of Ped., August, 1929, Volume XLVI, No. 8). Beriberi is produced by a deficiency of vitamin B. It may be due, as in the cases to be reported, to an inability of the organism to abstract this substance from the ingested food.

Polished rice from which the pericarp and aleurone layers have been removed, when the chief article of diet, is the most common cause of beriberi.

Beriberi is a composite of three main sets of symptoms:

1. The symptoms of peripheral neuritis.
2. Cardiac insufficiency.
3. A generalized tendency to edema.

A study of celiac disease reveals in some of the severe cases the presence of all the classical symptoms of beriberi, edema, pallor, dyspnea, cardiac dilatation, parasthesias, weakness, irritability, and paralyses.

Beriberi is due to the absence of vitamin B from the diet. Celiac disease is characterized by an inability of the organism to utilize carbohydrates, the chief carriers of vitamin B. The end result in either case is the same whether vitamin B is not ingested or whether it is not absorbed.

The pathology of beriberi and celiac disease is the same, excepting that in beriberi nerve degeneration has been frequently demonstrated, while there is no report available of any case of celiac disease in which the nerves have been examined. The presence of paralyses in the latter disease makes it probable that examination of the nervous system would reveal such degeneration. The symptoms are almost identical excepting that constipation is common in beriberi; diarrhea, in celiac disease. Cardiac symptoms are often prominent in beriberi, while not prominent in celiac disease.

For a long time the resemblance of cases of celiac disease to the published description of beriberi made it seem probable that celiac disease and beriberi might be the same disease, but the absence of classical signs in other cases, made this conclusion unlikely.

R. N. Andrews, M.D.

DANGER SIGNALS IN NEW-BORN INFANTS: Julius Levy, M.D., Trenton, N. J. (Arch. of Ped., November, 1929, Vol. XLVI, No. 11). For the past 14 years in the City of Newark, there has been practically no reduction in the neo-natal mortality, that is, the deaths in the first month of life.

Cerebral hemorrhage is more common than is generally thought. In a study made of a large series of new-born, it was found that some bleeding occurred in as high as one-third of all births, often without any symptoms.

First is the importance of giving careful thought to an infant who fails to nurse successfully. When taken to the breast, it makes very little effort either to take the nipple or leave that nipple, that is, it is apathetic.

You should be suspicious about the new-born infant who is good, and who does not cry. The infant with cerebral hemorrhage does not cry easily, even under irritation.

Inanition. Another condition which is well to discuss is brought about by insufficient nutriment or water in the first few days, causing weight loss. If such an infant is being put to the breast regularly and apparently nursing, we are apt to believe that it is receiving sufficient nutriment and sufficient water. Weighing such infants before and after nursing has satisfied us that babies can go through sucking motions without abstracting practically anything from the breast. The supply of an ounce of water every three hours with possibly a five or ten per cent glucose solution will help to tide over these infants until the mother secretes more milk or the infant is put on artificial feeding.

The danger signals in a premature baby are, first, subnormal temperature; second, loss of weight, and sudden rise of temperature. An attempt should be made to keep the body temperature above 97 degrees and below 101. The subnormal temperatures are due to the immature and unstable heat centers. The danger of loss of weight is readily understood, since the premature infant is born without any water or fat reserve. Sudden rise in temperature is the result of infection, disturbances of metabolism, or an excessive supply of artificial heat. In order to maintain the body temperature, it is not necessary to have specially constructed incubators. Surrounding air should be between 85 degrees and 90.

Pyloric Stenosis. Well-nourished breast-fed infants who suddenly begin to vomit at or about 4 to 8 weeks of age should be suspected of having a pyloric spasm or pyloric stenosis. This vomiting is characteristic in that in the first place it starts rather suddenly and that the vomiting is much more profuse and much more energetic than the usual regurgitation or vomiting from indigestion. It is not uncommon to be informed that the vomiting was less after every change in formula. Atropin sulphate in proper dosage will control practically every case of pyloric spasm and pyloric stenosis. Doctors are unwilling or afraid to give the proper dosage. Infants six weeks old are given as much as one-twenty-fifth of a grain of atropin sulphate in 24 hours. Recently an infant 11 months old was cleared up in six weeks atfer receiving one-hundredth of a grain of atropin every three hours.

R. N. Andrews, M.D.

BREAST FEEDING: Jesse R. Gerstley, M.D., Chicago (Arch. of Ped., December, 1929, Vol. XLVI, No. 12). For centuries no one has disputed the superiority of maternal nursing, but still, for some reason or other, it has been subjected to relatively little scientific scrutiny.

Scanning the tables, one is impressed with several things. First, that in each baby the amounts taken at the individual nursings during the day were quite variable. In keeping with this, note the varying amounts of food taken daily in 24 hours. It will be seen that no days are identical. One of the most surprising observations is the enormous quantity of milk taken by the first baby at some of his nursings, even during the early months of life. As early as the fourth week it will be noticed that this baby took as much as 8½ ounces and two days later nine ounces at one 20 minute nursing.

Notice how much less the younger brother took when of the same age, and again note that the younger brother, even when he reached the weight of the older, still never took such quantities even though the breasts were full.

These results show what many pediatricians have felt and repeated frequently, that it is impossible to standardize the diets of infants. What they take depends primarily upon their own constitutional demands. We should take a lesson from this in bottle feeding. Maybe it would be wiser to expect the infant to show decided variations in the amounts taken in the individual bottles and in the daily 24 hours, rather than to expect him to show superhuman accuracy.

R. N. Andrews, M.D.

A FURTHER REPORT OF THE TREATMENT OF WHOOPING COUGH BY INTRAMUSCULAR INJECTIONS OF ETHER: Julius Levy, M.D., and A. S. Finkelstein, M.D., Newark, N. J. (Arch. of Ped., December, 1929, Vol. XLVI, No. 12). A report on the treatment of whooping cough by injections of ether was made in Archives of Pediatrics, July, 1928. It was pointed out on account of the high percentage of necroses, it did not seem to be a desirable treatment. Later experience with a modification in the method has caused them to change their opinion and they are, therefore, making a second report on the treatment of an additional 104 cases.

Of the 104 patients, 76, or 74 per cent, were termed *improved;* 23, or 22 per cent, were termed *unimproved;* 5, or 4 per cent, were termed *slightly improved.*

Ninety-four patients received the usual dosage of one ampoule intramuscularly, containing one c.c. of ether plus one c.c. of oil. Ten patients received double the dose, or two ampoules.

Among the entire 104 patients treated, no abscess or necrosis at the area of injection was seen. The meth-

od of treatment consisted of cleansing the skin with five per cent tincture of iodine, washing off with 95 per cent alcohol, giving the injection in the buttocks, alternating sites of injection. No other medication was allowed.

All the children bore the injections well. The age of the patient did not seem to enter into the matter of improvement or dosage. They suggest a further study with double the dosage, two c.c. of ether in two c.c. of oil, since it may be that a larger dose will bring even better results. The treatment at first is given every day.

R. N. Andrews, M.D.

SINUSITIS AND TUBERCULOSIS IN CHILDREN—Central Pulmonary Infection Secondary to Sinusitis in Children Simulating Juvenile Tuberculosis: Henry A. Reisman, M.D., Jamaica, N. Y. (Arch. of Ped., November, Vol. XLVI, No. 11). Although the two conditions may at first appear somewhat remote, the resultant pulmonary infections that may arise as a complication to a primary sinusitis may present a picture clinically, physically, and roentgenologically so similar as to be at times very confusing with that of juvenile tuberculosis. Sinusitis has long been recognized as a clinical entity, but it is only in the last several years that we have begun to appreciate its prevalence, complications and sequelæ. Dean, White, Oppenheimer, Marriott and others have reported sinusitis with considerable frequency in children.

The white race is anatomically peculiarly more susceptible to sinusitis than the colored race because of the tendency to and frequency of nasal obstruction in the former and wide nasal chambers with free drainage in the latter. Accordi, in 1911, stated that it should be regarded as an established fact when children suffer from frequent attacks of head colds that some of the accessory sinuses are involved.

All cases of sinus infections should be regarded as potential chest cases just as all cases of tonsillitis are regarded as potential cases of cervical adenitis.

Mullin and Ryder in 1921 found, first, that the lymphatic drainage of the antrum is by way of the submaxillary and retropharyngeal glands into the internal jugular nodes and deep cervicals, then into lymph ducts, great veins, right side of heart and into the lungs by way of the pulmonary artery; second, extension by inhalation.

The association of sinus and pulmonary infections has been noted too often to be coincidental. The incidence of sinus involvement and the result of the treatment of the sinusitis upon the pulmonary infection were striking. The general condition greatly improved.

Possibly a large proportion of non-specific chronic pulmonary infections, which have been observed in the past, have been the result of unrecognized and untreated sinusitis.

The physical signs in the chest are almost identical in the early stages of both conditions. When râles are present, the râles secondary to sinus infection are usually of the large moist character, whereas those from the tuberculous infection are of the fine crepitant type. It is surprising how many of these children have no symptoms or clinical evidence pointing to sinus disease despite the existence of the same.

If the tuberculin test is negative we must then look elsewhere for the cause of the pathology in the central lung field and it will often be found in the sinuses. But if the tuberculin test be positive and sinusitis present, it is a difficult problem to tell how much of the superimposed pathology could be attributed to secondary changes from the sinusitis and how much to the tuberculous focus.

R. N. Andrews, M.D.

A FURTHER CONTRIBUTION ON CELIAC DISEASE: Charles Gilmore Kerley, M.D., New York (Arch. of Ped., January, 1930, Vol. XLVII, No. 1). The author looks upon celiac disease as a clinical entity and not simply an aggravated chronic gastro-intestinal indigestion. Every case presents the classical signs of extreme emaciation, large abdomen, copious, foul stools, anorexia or capricious appetite, the characteristic facial expression, and greatly disturbed mental reaction.

The plan of management is to discontinue milk in all forms and combinations and use a powdered casein. The Walker Gordon Laboratory prepares the casein mixture in most of the cases after the following formula:

Casein (sodium caseinate)	2¼ ounces
Starch (baked barley flour)	2¼ ounces
Sugar (can, lactose or karo)	2¼ ounces
Water	30 ounces

This combination gives a caloric value of about 16 per ounce.

Early in the case, the author uses the casein, starch, sugar mixture as the only means of nourishment together with a teaspoonful of sherry wine diluted with a small portion of water at two or three-hour intervals. After a few days, perhaps a week, ground rare beef, white meat of chicken, powdered hard-boiled egg yolk, gelatine pudding, banana and bread crusts are added. He endeavors to give orange juice early in every case. As a rule, cod liver oil is not well tolerated even in small amounts and it is rarely used.

When the acute symptoms are somewhat in hand, a decoction made from potato, turnip, carrot and celery is given in small amounts. Relapses of a temporary nature often occur and the stools return to the former characteristic odor and appearance.

Cases in which there is a tendency to diarrhea he gives 20 grains of bismuth subnitrate every two hours with small dosage of Dover's powder.

The satisfactory results in these cases are due to the fact that cow's milk was entirely omitted from the diet.

R. N. Andrews, M.D.

MUCOUS AND UMBILICAL COLIC IN CHILDREN: George J. Feldstein, M.D., Pittsburgh, Pa. (Arch. of Ped., January, 1930, Vol. XLVII, No. 1). The diagnosis of the cause of abdominal pain in children demands even more frequently than in the adult a consideration of conditions extraneous to the abdomen itself. The most familiar example is the referred pain to the abdomen, as in cases of pneumonia, pleurisy, endocarditis, pericarditis, the intestinal form of influenza, and the abdominal pains of throat infection.

There are, in addition to these causes, two conditions of great clinical importance in childhood—mucous and umbilical colic, which may simulate more serious abdominal conditions.

These forms of abdominal complaint in children have as a background two factors, as a rule: (1) An hereditary constitutional tendency; (2) Bad environmental surroundings.

It was Moro who pointed out that cases of umbilical or navel colic have nothing to do with appendictis, and are to be handled by suggestive treatment. These cases are characterized by frequently recurring attacks of apparently violent abdominal pain, which are mainly referred to the region of the umbilicus. Frequently there is vomiting.

The cause of this peculiar type of colic is cramplike contractions of the bowel.

Mucous colic which is similar to umbilical colic in its etiology, severity of the abdominal complaint, and which occurs in the same type of neuropathic children, is characterized by the periodic passage of large masses of mucous often in the form of tubular casts, ribbons, or shreds, with violent colic and tenesmus.

In umbilical colic there is no inflammation in the intestinal tract. It is purely a secretory neurosis in constitutionally predisposed children, and is due to hypersecretion of the glands of the intestinal mucosa.

Treatment of Mucous Colic: Colonic irrigations with salt solution or enemata of oil are of value in acute cases or in the sub-acute. In cases with a tendency to diarrhea, the diet should be mainly protein. Sodium bromide should be used to quiet the underlying neuropathic condition. Suggestive treatment as for navel colic is also indicated. The treatment of cases having a neuropathic basis only is chiefly by suggestion.

R. N. Andrews, M.D.

CHOREA: ITS GENESIS AND ITS CLASSIFICATIONS: J. Epstein, M.D., New York (Arch. of Ped., Feb., 1930, Vol. XLVII, No. 2). Chorea is a constitutional neurosis. In many cases there is a familial tendency. The choreic disorder is most common during childhood, when the nervous and psychic mechanisms have not yet acquired the poise, steadiness and orderly conduct essential to proper neuro-psychic functions. Chorea may be divided into three classes: Pathologic, or infectious chorea, physiologic or functional chorea, and psychologic or emotional chorea.

Pathologic or Infectious Chorea.—Chorea was definitely traced to rheumatic infection as the exciting cause. In all cases of pathologic or infectious chorea, the infection acts only as an exciting cause on an underlying choreic neurosis.

Physiologic or Functional Chorea.—These children were unusually active, irritable, quick and irregular in their actions. When to this physiologic hyperfunction was added some unusual physical or mental pressure, reflex irritation, thyroid overwork, puberty, the onset of menstruation, or any other new physiologic demand, a choreic disorder was the result.

Psychic or Emotional Chorea.—These children were extremely emotional, subject to convulsive attacks and night terrors. Others laughed unduly and displayed a violent temper. An added sudden mental shock as from fright or grief precipitated an attack of chorea.

Diagnostic Symptoms and Signs.—The symptoms and signs of chorea are the result of both the primary neurosis and the secondary etiologic factors. In all cases there is twitching, turning, twisting or jerking of the various parts of the body, due to irregular, discordant contractions of groups of muscles. The entire motor system may be said to be in a state of fibrillation.

Chorea in itself offers a favorable prognosis. It is the damage to the heart that makes chorea a formidable disease. Post-choreic endocarditis is quite common in the infectious type of chorea. Chorea frequently injures the nervous and psychic systems of the child. A close observation will show that these children react abnormally to the ordinary physiologic and psychologic events of life.

Treatment.—Physical and mental rest are imperative. Foci of infection must be removed. Hydrotherapy in the form of warm baths or cold spronges, depending on the child's reaction, are very useful .

R. N. Andrews, M.D.

BISMUTH THERAPY EXCLUSIVELY IN CONGENITAL SYPHILIS: John F. Coppolino, M.D., Philadelphia (Amer. Jour. of Dis. of Children, February, 1930, Volume 39, Number 2). Congenital syphilis has always been refractory to treatment. Since the introduction of bismuth as an antisyphilitic agent, much has been written of its use in acquired syphilis, but comparatively little concerning its value in the congenital form.

The preparation used was bismuth salicylate in oil suspended together with camphor and creosote, 1 c.c. of which contains 130 mg. of metallic bismuth. In the earlier cases he started with a dose of from 15 to 30 mg. in young infants, and 65 mg. in older children. The dose was increased to 65 mg. for children under 1 year of age, and to 130 mg. in older children.

The course of treatment consisted of twenty injections at weekly intervals. A blood test was taken at the beginning and termination of each course, and if it was positive, the treatment was immediately continued; if negative, a four weeks' rest was allowed. The maximum number of courses administered was three, after which the patients returned every month for examination and blood tests.

The injection is given alternately and deeply into

the upper and inner quadrant of each buttock. Care must be exercised that a blood vessel is not encountered as evidenced by drawing blood into the syringe. After the injection has been made, the syringe is disconnected from the needle, which is left in situ. Air is drawn into the syringe and injected. This clears the canal made by the needle of any bismuth that may be forced back, especially if the muscles contract. The needle is then withdrawn, firm pressure applied and the part massaged. If this is done, then infiltration and induration previously reported will be reduced to a minimum.

Conclusions.—(1) Bismuth in rather large doses is apparently well tolerated by infants and children. (2) It is useful in the treatment of older children, but does not effect cure. (3) It is more efficacious in young infants, rendering them both symptom-free and serologically negative. (4) No absolute valuation of the drug can be made at the present time. These cases should be followed for several years to determine the permanency of results.

R. N. Andrews, M.D.

ROENTGENOLOGY

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ROENTGEN DIAGNOSIS OF LESIONS OF THE JEJUNUM AND ILEUM. Max Ritvo, M.D. (Am. Jour. Roent. Feb., 1930, XXIII, 160). A brief résumé is given of the conditions affecting the jejunum and ileum which can be demonstrated by X-ray examination. These lesions are relatively rare but of great importance when present. Diagnosis by clinical methods is very difficult and often impossible and the roentgen examination is frequently the only method of arriving at a diagnosis preoperatively.

The conditions discussed are:

1. Obstruction—this can be studied by plain films of the abdomen or after the administration of an opaque meal.
2. Hypermotility—this is best studied both fluoroscopically and by films made at intervals.
3. Diverticula—these may be single or multiple.
4. Malpositions and displacements—these are relatively common.
5. Adhesions—these are best observed by roentgenoscopic studies.
6. Tuberculosis—is located most commonly in the cecum and terminal ileum and shows irritability with hypermotility and filling defects.
7. Ulcers—these are difficult to diagnose.
8. Neoplasms—these are very rare and difficult to demonstrate.
9. Foreign bodies—the opaque ones are easily demonstrable.
10. Postoperative changes—this is particularly valuable in demonstrating function following gastroenterostomy.

The roentgen findings of each of these conditions are discussed briefly and the chief diagnostic points outlined.

Jacob Sagel, M.D.

THE PRESENT STATUS OF HYSTEROSALPINGOGRAPHY: A. R. Witmer, M.D., H. P. Cushman, M.D., and T. Leucutia, M.D. (Am. Jour. Roent., XXIII, Feb., 1930, 125). The authors present a very complete review of the literature and a report of 512 personal cases. The various contrast media used in hysterosalpingography are described and the advantages and disadvantages of each presented. Their technic is also given.

They conclude that hysterosalpingography by means of lipiodol is a safe and simple procedure. The method is of great diagnostic value in developmental anomalies of the genital organs, in tubal affections leading to sterility, in certain very carefully selected cases of pregnancy in which therapeutic abortion is indicated or where a differential diagnosis from other obscure conditions is essential, in uterine tumors, excepting malignancies, and in certain extra-uterine tumors. The contraindications are recent hemorrhage, inflammatory conditions that are not completely quiescent, active infections or malignancies involving the cervix, previous intra-uterine interventions, ectopic gestation or uterine gestation in which a therapeutic abortion is not desired, infected uterine or cervical polyps and fever. In certain instances the injection of lipiodol is of direct therapeutic valuee.

The article is accompanied by 49 plates illustrating the conditions described.

Jacob Sagel, M.D.

INTERPRETATION OF ROENTGENOGRAMS OF CHEST IN CHILDREN BASED ON OBSERVATIONS OF NECROPSY: John A Bigler, M.D., Chicago, Ill. (Amer. Jour. Dis. of Child., Nov., 1929, Vol. 38, No. 5, p. 978). One hundred seventy-one pairs of lungs were examined post mortem. These children died in hospitals which do not admit contagious or open tuberculosis cases.

During life roentgenograms were made at intervals. After death a roentgenogram was taken of the chest and finally of the excised lungs inflated with air. Sometimes opaque substances were injected into the circulatory system of the lungs, the bronchial tree, or both, and pictures taken. Some of the lungs were fluoroscoped from different angles. The lungs were then dissected and microscopic sections made.

Even under the ideal conditions afforded by roent-

genograms of excised lungs the bronchi could rarely be followed farther than the inner third of the lung field. In the injected lungs the bronchi could be followed to the periphery. Circular areas of decreased density near the hilum are caused by bronchial branchings, parallel to the axial ray. They become opaque in the injected lung.

The linear markings were more marked and showed finer detail in the pictures of the excised lungs with the vessels from the heart tied off so that no blood could escape. When the blood was washed out of the pulmonary vessels, the markings became less distinct. The beaded shadows of the trunks disappeared. Injection of these vessels increased the linear markings.

Linear markings are due to blood in arteries and veins and to a lesser extent to the bronchi. Blood vessels give shadows of even density; bronchi give two shadows with a narrow band of decreased density between. Nodular areas along the linear markings are not due to tubercles or lymph nodes, but branches of blood vessels parallel to the axial ray.

Round, definitely circumscribed areas of increased density in the hilum or inner third of the lung fields are not due to lymph nodes or scars, but to branches of large blood vessels. They practically always occur in the course of the linear markings and change position or disappear on successive exposures.

Dissection showed lymph nodes present in every hilum. Increase in size and number of these nodes did not cast shadows on the films. Only nodes that contained calcium were recognized in the roentgenograms of excised lungs.

In children that died after measles or pertussis, the hyperplastic, inflammatory tracheobronchial glands cast no characteristic shadows. The increase of hilar shadows in these cases is explained by pressure atelectasis, and inflammation with exudation of the surrounding lung tissue.

Caseous lymph nodes also failed to cast shadows unless they contained calcium.

It is therefore concluded that normal lymph nodes cast no shadows; hyperplastic nodes, whether caseous or inflammatory, whether in the hilum or intrapulmonary tissue, cannot be recognized if they do not contain calcium. They will not cast shadows unless they are large enough to encroach on the pulmonary fields.

G. J. Ferreira, M.D.

BRONCHIAL OBSTRUCTION—ITS RELATION TO ATELECTASIS, BRONCHOPNEUMONIA AND LOBAR PNEUMONIA: Pol N. Coryllos, M.D., and George S. Birnbaum, M.D. (Amer. Jour. Roent., Nov., 1929, XXII, 401). The authors present a roentgenographic, experimental, and clinical study of bronchial obstruction and its relation to atelectasis and pneumonia. Bronchial obstruction is a factor common to both of these conditions, the only difference being the nature and virulence of the microörganisms present in the occluding exudate. The lobar pneumonias and atelectases were produced by bronchoscopic methods and checked by serial roentgenograms which showed a striking similarity in appearance. Seven possible objections to this theory are discussed.

The authors conclude that lobar pneumonia is a pneumococcic atelectasis due to bronchial obstruction by mucous exudate infected with virulent pneumococci, and that atelectasis or apneumotosis (generally, but not always, a postoperative pulmonary complication) is due to bronchial obstruction with mucous exudate infected with pneumococcus Group IV, an organism of low virulence. The role of bronchitis in the evolution of the disease syndrome is represented by: bronchitis—atelectasis—pneumonia.

The article presents an excellent study of this subject and is well illustrated by roentgen plates of both human beings and animals, and gross and microscopic pathology. A review of almost the entire literature is included.

Jacob Sagel, M.D.

EYE, EAR, NOSE AND THROAT

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THE TONSILS AND SOME EXPERIENCES OF THEIR SURGICAL TREATMENT: Herbert Tilley, F.R.C.S. (Eng.), London (Surg., Gynec. and Obstet., Jan., 1930, 1.1A. 167). Résumé of an address presented before the Clinical Congress of the American College of Surgeons, at Chicago, Oct. 14-18, 1929.

After a somewhat apologetic introduction for the subject of discourse the author steps into the various phases and conditions one is liable to encounter and also some of the abnormalities seen in the practice of an otolaryngologist.

The term "supra tonsillar fossa" comes in for his first criticism. He states that since that space is lined with epithelium, contains more or less loose lymphoid tissue and is within the capsule of the tonsil it would be more correct to speak of it as the "tonsillar fossa."

In passing he mentions a long ossified stylohyoid ligament as well as isolated spicules of bone and cartilage. These he thinks are embryonic "rests" of the branchial arches. The author next presented a specimen of an osteoma removed from the tonsillar fossa and the soft palate. Tonsillar calculi cause pain in the tonsil when swallowing and also in the depth of the aural meatus. This cause of deep aural pain is often overlooked. He next calls attention to the protective function of Waldeyer's ring and the presence of a lateral pharyngeal ring in many cases where tonsils have been removed early in life. The presence of tonsillar tissue in the lower part of the fossa is often the result of the lingual tonsil pushing upward instead of

having been left by a previous operator. This he attributes to compensatory developments.

Tonsillar surgery is indicated in some cases of diphtheria when a throat will not give a negative culture; in some cases of so-called tuberculous infection of the lymph glands; in chronic arthritis; and malignant disease. He does not take a stand as to the time to operate in cases of so called rheumatism.

Among the complications of tonsillectomy he first mentions hemorrhage; next, pulmonary complications. To prevent hemorrhage he ligates the descending branch of the posterior palatine artery in every case and if necessary the tonsillar branch of the facial. He removes the tonsil by dissection in all cases. Of pulmonary complications he has had no experience, so says little about them.

ARTHUR C. DEAN, M.D., F.A.C.S.

SOME POINTS IN THE TREATMENT OF MENINGITIS: G. J. Jenkins (Jour. of Laryng. & Oto., Vol. XLIV, No. 4, p. 239). In many cases of meningitis secondary to septic middle ear disease, the infection has not reached the sub-arachnoid space, so these cases can be treated well by the complete removal of the external inflammation. But this should be done only early in the disease and in any case where we suspect the infection has extended to the sub-arachnoid space, it should be opened and washed out.

Lumbar puncture is dangerous and should be done only as a diagnostic procedure, and then only 6 cc. should be withdrawn. In borderline cases it is well to wash out the sub-arachnoid space, as the risk is no greater, if one carefully cleanses the wound before doing so.

The principle of the following procedure in a case, for instance, of meningitis secondary to septic labyrinthitis, is to drain the meninges from the point of maximum infection, i.e., the labyrinth, and encourage the flow of cerebro-spinal fluid through this area, by washing through from the lumbar region.

In preparation no morphine or atrophine should be used. Prepare some iodoform by washing it free of perchloride with modified Locke's solution. Then 6 cc. of spinal fluid is removed by lumbar puncture and sent to laboratory.

A superior and inferior labyrinthotomy operation is done. The wound is washed with hydrogen peroxide and saline, then with 2 per cent alcoholic solution of iodine. A fine needle is passed into the labyrinth and the latter is then washed with the iodine solution. It is now determined by the pathologist's report if further procedure is necessary. If so, fresh instruments and supplies are used. Lumbar puncture is repeated allowing only 1 or 2 drops of fluid to escape, so determining if the needle is in the sub-arachnoid space. The lumbar puncture needle is left in. Then an opening is made into the internal auditory meatus, through the inner wall of labyrinth. When the flow of fluid is established the lumbar puncture needle is connected with a reservoir of modified Locke's solution. A piece of silk-worm gut is inserted into the wound and this is left as a drain. When a few ounces of solution have passed through, serum containing 8 grains of the prepared iodoform is injected through the lumbar needle. Locke's solution is again allowed to flow until the return from the ear is clean.

Sometimes when the internal auditory meatus does not afford drainage, the cisterna pontis may be reached in front of the cerebellum. In this route considerable bone must be removed behind the lateral sinus, so a drain may be inserted along the posterior surface of the temporal bone through the dura and internal to the sinus. The wound should be packed with iodoform gauze.

As the blood pressure is always low attempts should be made to increase it, and thus increase the flow of cerebro-spinal fluid.

If drainage ceases too early it may be necessary to reëstablish it and in some cases to rewash the sub-arachnoid space.

L. G. FLANAGAN.

ACUTE PURULENT MENINGITIS OF AURAL ORIGIN: J. P. Stewart (Jour. of Laryng. & Oto., Vol. XLIV, No. 4, p. 225). The series of cases on which this report is based consists of seventy-eight cases following chronic, and thirty-six acute, purulent middle ear conditions. These cases occurred at the Edinburgh clinic. Acute purulent meningitis occurs chiefly before middle life, seventy-four per cent occurring before the age of thirty. It also seems to be predominant in males.

The early clinical manifestations are chiefly due to irritation in the posterior fossa, this because of the aural origin of the infection. There is anxiety and confusion, with deep severe headaches in the frontal region but shifting frequently. Frequent first complaints of the patient are pain on brushing the hair and stiffness of the neck. The temperature rises rapidly and remains elevated but the pulse and respiration are at first slow, due to vagal irritation, but towards death rapidly rise. Mendel found early hyperaesthesia of the posterior meatal wall, due, presumably, to the reflex transmission of pain from the inflamed meninges, since the auricular branch of the vagus is connected with the meningeal nerves through the jugular ganglion. Frequently there is pain on pressure over the atlanto-occipital membrane when the tension of the cerebro-spinal fluid is elevated. Usually there is a leucocytosis of about 20,000 with a polymorphonuclear predominance.

The cerebrospinal fluid early is clear or slightly turbid, with the pressure varying, although increased. The cell count is above 4 per cubic mm. There is only a trace of globulin and the total protein is increased. Later the fluid is turbid to purulent and the cell count is increased, with also a relative increase of polymorphonuclears. The chlorides and glucose decrease.

In making the diagnosis serous meningitis is ruled out by the high cell count. Cerebellar abscess usually has a cell count of below fifty, with a small lymphocytic predominance; its chloride content is usually unaltered and the glucose is increased. The fluid is always

sterile. Meningism occurs only in young children, and the fontanelle pulsates.

The prognosis is generally bad. In this series there was a 93 per cent mortality, only one of the acute ear cases recovering. Early diagnosis, however, and operative procedure improve the percentage.

The only chemical treatment of any value consists of 50 cc. of 10 per cent sodium chloride daily. The operative treatment regardless of origin depends chiefly on free drainage of the cerebro-spinal fluid. Continuous drainage should be established, if possible, as through the internal auditory meatus, or by frequent spinal drainage. Seven of the eight cases recovering had daily spinal punctures, and the other had good drainage through the labyrinth. Added to this there must be drainage of the original source of infection and free exposure of the dura, since all recovering cases had a radical mastoid performed.

L. G. Flanagan.

THE HOROVITZ PROTEINS AND LIPOIDS AGAIN

"Lipoidal substances" and "protein substances" are marketed under various names by variously named firms. Always, apparently, the chemistry is performed by and the claims are made through A. S. Horovitz. In 1915 it was an alleged cancer cure, "Autolysin," a poultice or extract made from a number of herbs. Then came the "Proteogens" of the William S. Merrell Co., reported on unfavorably by the Council on Pharmacy and Chemistry in 1918. They were numbered, different ones being for the treatment of different diseases. These mixtures of vegetable proteins were exploited to physicians by a sad outpouring of pseudoscience. Next Horovitz became identified with the Horovitz Biochemical Laboratories, with a line of "Protein Substances" similar to the "Proteogens," each claiming to be more or less specific for some disease. Now the successor to the Horovitz Biochemical Laboratories is the Lipoidal Laboratories, Inc., and a number of supply houses act as agents for the firm. "Gonolin," "Luesol," "Osmogen," "Arthritine," "Asthmazine" and other preparations similar in stated composition and therapeutic claims to the Proteogens are now promoted for physicians who think that the "bosh" in the circulars is good science because it is so confusing that it is not comprehensible. (Jour. A. M. A., December 21, 1929, p. 1975.)

THE ETIOLOGY OF INFLUENZA

I. S. Falk and his colleagues publish a preliminary report of their work on the etiology of influenza which does not go far beyond previous research on influenza. The difficulty in interpreting the results is largely due to the fact that it is difficult to distinguish clinical epidemic influenza from acute respiratory infections in monkeys and, indeed, in man. In 1892 Pfeiffer described an organism as the causative organism of influenza and since that time other allegedly causative organisms have been described. The green-producing streptococcus isolated by Mathers and Tunnicliffe in 1918, the one isolated by Rosenow in 1919, the filter-passing organism described by Meyer in 1919, and the organism discovered by Olitzky and Gates called *Bacterium pneumosintes,* would seem to deserve as much consideration as should be given, at least on the basis of the available evidence, to the germ recently announced by Falk. (Jour. A. M. A., December 28, 1929, p. 2034.)

MALLOPHENE

Mallophene is the proprietary name under which the Mallinckrodt Chemical Works markets an azo dye of the pyridine series. The patents on the product are owned by another corporation and the Mallinckrodt firm manufactures it under license from the holding company. It is regrettable that the Mallinckrodt Chemical Works sees fit to use for this preparation a different proprietary name from that used by the patent owners. The use of a number of proprietary names for identical products creates chaotic conditions. Mallophene has not been submitted to the Council on Pharmacy and Chemistry, although the firm which owns the patent has submitted its product to the Council. The Mallinckrodt firm does not appear to have presented evidence to justify the medical claims which it advances. It is to be regretted that the Mallinckrodt Chemical Works offers its product to the medical profession without first submitting it to the Council on Pharmacy and Chemistry—a recognized body working in the best interests of both the profession and the public health. (Jour. A. M. A., December 28, 1929, p. 2044.)

UVIOL-JENA ULTRAVIOLET TRANSMITTING GLASS ACCEPTABLE

The Council on Physical Therapy reports that the window glass known as Uviol-Jena, manufactured by Schott and Gen., Jena, Germany, and submitted to the Council by the Fish-Schurman Corporation, New York, is stated to be "a glass which transmits the biological ultraviolet rays of the sun" and "in a thickness of 2 millimeters transmits at the time of installation about 60 per cent of the ultraviolet rays of a wave length of 302 millimicrons" and "even after 'solarization' it still transmits about 48 to 45 per cent of these same rays." The Council reports that acceptable evidence in favor of these claims was submitted, and hence declares it acceptable for inclusion in its list of accepted devices for physical therapy. (Jour. A. M. A., December 14, 1929, p. 1887.)

MEDICAL TREATMENT OF CATARACT

About every five years, the ophthalmic world is thrilled by the announcement of a new medical cure for senile cataract. This has been going on for at least two hundred years. Boric acid and glycerin, ethylmorphine hydrochloride, subconjunctival injections of mercuric cyanide, radium, antigenic injections of lens proteins, mixed endocrine glands, sodium iodide in all possible combinations, and so on, have all had a trial. Not one of them has been scientifically established as of value, and more cataracts are being operated on than ever before. (Jour. A. M. A., December 14, 1929, p. 1910.)

EXAMINATION REPORT, MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, JANUARY, 1930

BY EXAMINATION

Name	School and Date of Graduation	Address
Anderson, Philip Andrew	U. of Minn., M.B., 1928; M.D., 1929	11 Nourse St., St. Paul, Minn.
Arlander, Clarence E	U. of Minn., M.B., 1929	General Hospital, Minneapolis
Barnet, Emmanuel Green	U. of Minn., M.B., 1929	St. Joseph's Hospital, St. Paul, Minn.
Benson, Theodore Quentin	U. of Minn., M.B., 1929	515 Delaware St. S.E., Minneapolis
Berghs, Lyle V	U. of Minn., M.B., 1928; M.D., 1929	Owatonna, Minnesota
Bjelland, Paul A	U. of Minn., M.B., 1929	200 Oak Grove St., Apt. 206, Minneapolis
Church, Gerald T	Syracuse Univ., M.D., 1927	Mayo Clinic, Rochester, Minn.
Cummings, William G	U. of Minn., M.B., 1928; M.D., 1929	Glen Gables, Park Ave., Glencoe, Ill.
Decker, Fred Henry	Rush, M.D., 1927	Mayo Clinic, Rochester, Minnesota
Gregory, Raymond Leslie	U. of Minn., M.B., 1929; M.D., 1929	General Hospital, Minneapolis
Harris, Milo Truman	U. of Texas, M.D., 1928	Ancker Hospital, St. Paul, Minn.
Holte, Herman James	U. of Minn., M.B., 1929	3707 Columbus Ave., Minneapolis, Minn.
Hyde, Theodore Lincoln	Harvard, M.D., 1927	1301 1st St. S.W., Rochester, Minnesota
Jolin, Raymond Voigt	Rush, M.D., 1929	Lake Park, Minnesota
Kath, Reinhard H	U. of Minn., M.B., 1929	Ancker Hospital, St. Paul, Minn.
Kidder, Earle Elton	Northwestern, M.D., 1923	Rood Hospital, Hibbing, Minnesota
Kingston, James Richard	U. of Minn., M.B., 1929	Abbott Hospital, 1717 1st Ave. S., Minneapolis
Kullman, Harold John	Detroit Coll. of Med., M.B., 1926; M.D., 1927	Mayo Clinic, Rochester, Minn.
Lenz, Joseph R	U. of Minn., M.B., 1929	General Hospital, Minneapolis,
Leonard, Samuel	U. of Minn., M.B., 1929	University Hospital, Minneapolis
Manaugh, Hursel Conway	U. of Minn., M.B., 1929	527 5th Ave. S. E., Minneapolis
Michie, Thomas Campbell	U. of Alberta, M.D., 1926	603 1st St. S. W., Rochester, Minnesota
Morey, John Barnhart	U. of Buffalo, M.D., 1927	1201 1st St. S. W., Rochester, Minnesota
Neilsen, Harold F	U. of Minn., M.B., 1929	102 19th St. E., Minneapolis
Nelson, Carl Barton	U. of Minn., M.B., 1929	Swedish Hospital, Minneapolis
Onsgard, L. Kenneth	U. of Minn., M.B., 1929	Fairview Hospital, Minneapolis
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Russeth, Arthur N	U. of Minn., M.B., 1929	3012 Lyndale Ave. N., Minneapolis
Shimonek, Stewart Wenzel	U. of Minn., M.B., 1928; M.D., 1929	95 N. Lexington Ave., St. Paul, Minn.
Smith, Archie Merle	U. of Minn., M.B., 1929	5052 Vincent Ave. S., Minneapolis
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Telford, Vernon John	U. of Minn., M.B., 1929	St. Mary's Hospital, Duluth, Minnesota
Thornton, Harold Clive	Emory Univ., M.D., 1926	Mayo Clinic, Rochester, Minnesota
Webster, William Welch	U. of Nebr., M.D., 1928	Leland Apartment, Rochester, Minnesota
Whalen, Maurice Leo	U. of Minn., M.B., 1929	St. Luke's Hospital, Duluth, Minnesota
Wharton, George K	U. of Toronto, M.B., 1927; M.D., 1928	Mayo Clinic, Rochester, Minnesota
Zinn, Charles J	U. of Pa., M.D., 1927	Mayo Clinic, Rochester, Minnesota

BY RECIPROCITY

Cottam, Geoffrey I. W	U. of Iowa, M.D., 1926	Miller Clinic, Hamm Bldg., St. Paul, Minn.
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Sach-Rowitz, Alvin	St. Louis Univ., School of Med., M.D., 1921	McGregor, Minnesota
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REPORT OF OCTOBER, 1929

BY EXAMINATION

Carlson, John Victor	U. of Minn., M.B., 1929	St. Luke's Hospital, Duluth, Minnesota
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Elsey, Edward McClintock	U. of Minn., M.B., 1928	Box 162, Glenwood, Minnesota
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Grumke, Erwin Henry	U. of Minn., M.B., 1928	2261 Gordon Ave., St. Paul, Minnesota
Hanson, Lewis	U. of Minn., M.B., and M.D., 1929	Fairview Hospital, Minneapolis
Harper, Frederick Richard	U. of Mich., M.D., 1927	Mayo Clinic, Rochester, Minnesota
Harrington, Bernard Daniel	U. of Minn., M.B., 1928; M.D., 1929	Glen Lake Sanatorium, Oak Terrace, Minnesota
Iber, Frank C	U. of Cincinnati, M.D., 1924	612 7th Ave. S. E., Rochester, Minnesota
Johnson, Elmer Theodore	U. of Ill., M.D., 1929	1928 W. Superior St., Duluth, Minnesota
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Paton, Walter Mudie	U. of Toronto, M.B., 1924	Mayo Clinic, Rochester, Minnesota
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Bullard, Mattie Jane	Rush, M.D., 1928	Students' Health Service, University of Minnesota, Minneapolis
Collins, Donald Clark	U. of Calif., M.D., 1927	Mayo Clinic, Rochester, Minnesota
Cremer, Annabel Beatrice	Marquette, M.D., 1929	State Hospital, Rochester, Minnesota
Elofson, Carl Elof	U. of Kansas, M.D., 1929	St. John's Hospital, Fargo, N. Dak.
Ghormley, Ralph Kalb	Johns Hopkins, M.D., 1918	Mayo Clinic, Rochester, Minnesota
Gushurst, Edward George	Northwestern, M.D., 1921	1937 Aldrich Ave. S., Minneapolis
Morgan, Sherburne Francis	Marquette, M.D., 1927	Francis Drake Hotel, 10th St. at 5th Ave. S., Minneapolis
Rider, Albert Sparr	Rush, M.D., 1900	Flandreau, S. Dakota
Shane, James Howard	Harvard, M.D., 1927	Mayo Clinic, Rochester, Minnesota
Stewart, Gwendolyn	Coll. Med. Evangelists, M.D., 1921	Station A, Faribault, Minnesota

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MANIFESTATIONS OF HYPOTHYDROIDISM IN THE LIMITED FIELDS OF MEDICAL PRACTICE*

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Minneapolis

WITH the increasing use of simplified methods to estimate the heat production of the body, the clinician has available a supplementary method of studying disease which is valuable in proportion to the appreciation of all factors that alter such determinations. The chief application of clinical calorimetry to endocrine, particularly thyroid disease, sometimes leads to errors in diagnosis and therapeutic application which would be obviated if broader and more fundamental conception of nutrition were kept in mind. If an analogy from animal biology may be permitted, the marmot decreases its heat production 25 fold upon hibernating. In this instance the extreme lowering of the basal metabolism is related to physical and chemical factors and not primarily to changed thyroid function.

Starvation profoundly affects the basal metabolism. Benedict and associates[1] found in a group of twelve young men on a net available diet of 1,375 calories suddenly reduced from 4,000 calories in three weeks, that the average basal metabolism had dropped 27 per cent per square meter of body surface and that the individuals lacked physical strength and sense of well being. Lusk[2] states that there is specific reduction of the basal metabolism coincident with undernutrition, an innate protective mechanism. In contrast to this, high calorie and high protein diets tend to increase the basal metabolism. A very low basal metabolism personally observed, approximately minus 40 per cent, was noted in a dispensary patient markedly underweight who was starved on account of a gastro-intestinal condition and who was without thyroid disease. Likewise, an illustration may be taken of the neurotic individual with mucous colitis who cannot or will not eat sufficient food to maintain normal body weight and who has reduced heat production independent of any thyroid relationship. Inanition in the diabetic, formerly more prevalent, also tends to lower the oxidative processes. Indeed, any study of the basal metabolism of an individual may lose its significance as a therapeutic guide if factors such as inanition are neglected, which often are unrelated to thyroid function. In this connection it is worthy to note the complex of hysterical dysphagia first pointed out by H. S. Plummer and described by Vinson.[3] Plummer suggested that during the long period of inanition a light demand for thyroxin results in a disuse atrophy of the thyroid and that hypothyroidism may develop after the patient begins to swallow freely due to inability of the thyroid to furnish secretion enough to care for the increased food intake. Although noted in a rare condition the mechanism described may account for the lowered metabolism in more common forms of inanition. It may also be noted that physical inactivity over appreciable periods of time tends to lower the oxidative processes of the body.

An attempt has been made in this study to evaluate all the possible factors that influence the nutritional state of the individual and not alone the status of the thyroid without unreasoned emphasis upon the laboratory procedure of determining the basal metabolism. In this study, cases with lowered basal metabolism not due to other demonstrable cause who showed favorable therapeutic response to thyroid extract have been designated hypothyroidism. Clinical observations are noted upon thirty cases selected from a series representing all types of thyroid disease seen in dispensary and private prac-

*Read before the Minneapolis Clinical Club, Feb. 20, 1930.

tice. Myxedema is not included. The features of total loss of thyroid function are characteristic and well known even though an occasional patient is found who has drifted for years without detection of the disease. But partial loss of thyroid function presented here under the term hypothyroidism has presented such variations that they seem to be worthy of brief comment. Diversity of clinical pictures would be expected on a physiologic basis when the thyroid is considered as a regulator of oxidative processes which influence all the tissues of the body. Manifestations of thyroid deficiency have been noted with the predominating symptoms falling within the realm of several different fields and should be of interest to a diversified group such as this.

The skin has often given little or no manifestations in this group with partial loss of thyroid function. Dryness and scaliness have sometimes prevailed without the cutaneous and subcutaneous edema or pseudo-edema which characterizes and gives myxedema its name. Experimentally, hair loss may be shown to be due to diminished thyroid function. Indeed, in experimental animals after reduction or loss of thyroid function, hair changes, thinning and dryness are the most striking features. The veterinarians speak of the hairless pig malady in the northwest due to iodin and thyroid deficiency.

Especially interesting has been the relation of alopecia to thyroid function. Thinning of hair and eyebrows is not uncommon in myxedema. Nearly complete alopecia developing in a woman, M. R., aged 48, was associated with retarded thyroid function; the use of thyroid extract continued over a period of some months restored in a large measure the growth of hair. In other individuals in this series, chiefly females, hair changes were noted although not as the presenting symptom. On the other hand, acquired alopecia totalis in one young man had no demonstrable relationship to thyroid function, which was entirely normal. Partial alopecia in men has no demonstrable relation to thyroid function.

One case of scleroderma, C. M., a female, aged 38, showed retarded metabolism and presumably retarded thyroid function without, however, appreciable response to thyroid therapy. In another case, H. S., a female, aged 31, with reduced metabolism, cloasmic pigmentation of the face was markedly improved by the use of thyroid extract. Of interest also in this connection was the reported appearance of urticarial lesions in two individuals following the use of thyroid extract. Occasional swelling of ankles has been noted.

Undoubtedly, very important interrelationships known even to the ancients according to Marine[4] exist between thyroid and ovarian function. Dr. Litzenberg[5] and others have recently emphasized interference with reproductive function associated with diminished basal metabolism and its treatment by thyroid extract. One individual in this series, H. A. K., a female, aged 30, had definite hypothyroidism with a history of a previous stillbirth and sterility thereafter. Several years later, after normal thyroid function was restored, pregnancy supervened and terminated in another stillbirth; no other cause of which was found by the obstetrician. In the group studied, amenorrhea has usually been associated with other symptoms such as obesity, anemia, and colloid goiter and restoration of normal basal metabolism has at times been followed by the establishment of normal menstruation. Functional dysmenorrhea has not been especially studied but relief was noted occasionally after the use of thyroid extract in hypothyroid cases with other predominating symptoms.

Thyroid surgery has contributed only a small percentage of the cases of hypothyroidism. Remarkable physiological adaptation is shown in that the varying amounts of remaining thyroid tissue function within normal limits in a good percentage of cases with only infrequently the development of hypothyroidism. It would seem that as a rule the tendency has been to take out insufficient thyroid tissue rather than an excess, although that tendency is becoming less and less. and increase in postoperative hypothyroidism may occur. Marked asthenia with low basal metabolism after thyroidectomy has been noted in one case, G. B., a female, aged 20, that did not respond to the use of thyroid extract. Analysis of this case showed inanition rather than overweight, without other signs of thyroid deficiency, and suggested that undernutrition was the basis of the reduced metabolism rather than postoperative thyroid deficiency.

An extreme example of changed nutritional state after thyroidectomy is that of A. R., a female, aged 20, who within one year gained 70 pounds in weight with, however, reduction after

proper diet and thyroid extract administration. A distinct change in the nutritional state of the individual with weight gain without changed diet or habits, combined with diminished basal metabolism, has not infrequently been the indication for the use of thyroid extract. It seems rather paradoxical that of two individuals with weight loss one may show reduced and the other elevated metabolism. Its basis exists in the first instance in the depression of metabolism secondary to inanition; in the second instance to weight loss secondary to the accelerated metabolism characteristic of exophthalmic goiter.

Of interest in psychiatry, one case, D. B., a female, aged 21, with narcolepsy is included in this series, if in that category may be included persistent and repeated somnolence without regard to the appropriateness of the procedure, making effective work impossible. Thyroid extract proved effective in this case. Another similar case[6] with response to thyroid therapy has been called to the writer's attention. Not infrequently vertigo has been noted—also irritability and impairment of memory.

In the study of underweight children at Lymanhurst School by the writer[7] there was a tendency for the basal metabolism to be below the average normal. Indeed to the pediatrician who is interested in the basal metabolism of children with nutritional or endocrine disturbance, this study at Lymanhurst and others[8] indicate that undernutrition tends to decrease basal metabolism and that the overweight child usually has normal basal metabolism. Of course, the above tenet would not hold in the unusual condition in children when exophthalmic goiter is the basis of the underweight. Indeed, in pediatrics especial care should be taken in the interpretation of the reported basal metabolism. In the first place, normal standards available vary appreciably; in the second place, inanition not due to any thyroid or other glandular dyscrasia is associated with reduced basal metabolism; in the third place, the overweight child has been found generally to have a normal basal metabolism. Only comparatively seldom in children has thyroid deficiency been demonstrated as the cause of overweight.

From the standpoint of internal medicine, the problem of unexplained secondary anemia has sometimes had its solution suggested by the discovery of diminished thyroid activity. Response to treatment has been noted only after the combination of thyroid extract with other anti-anemia therapy. In this connection it should be noted that according to Lusk[9] the general oxidation of the body is normally maintained in anemia provided the disturbances are not of extreme intensity. In pernicious anemia, when the hemoglobin falls to 20 per cent of normal, the basal metabolism is increased. Secondary anemia deserves study from the standpoint of thyroid function. Case J. V., a female, aged 28, with hemoglobin of 35 and basal metabolism of minus 16 per cent showed marked improvement of anemia after thyroid extract and iron.

Likewise, in that ever present group, chiefly of women, with a low level of energy output, asthenia and weakness, the symptoms are occasionally associated with hypothyroidism. Weakness in the cases studied has been a universal symptom and the only one common to all cases. As a direct symptom of reduced metabolism, increased sensitivity to cold has been of value; heavy clothes and the summer season are appreciated by the individuals with reduced oxidative processes. M. C., a male aged 42, whose basal metabolic rate was minus 13 per cent and whose systolic blood pressure was 104 mms. of Hg. showed definite improvement of rather incapacitating weakness after taking thyroid extract. Attention should be called to the fact that the basal metabolism is usually normal in obesity and that gain in weight is more commonly exogenous than endogenous. The luxus consumption or adaptation of the body to an increased metabolism after a large influx of food finally wanes and storage of fat occurs. The increase in weight noted occasionally after lactation has more basis in over-ingestion of food and changed habits of exercise than in lag in thyroid function. Obesity as in cases M. M., female aged 38; C. R. C., female aged 23; W. W., female aged 31; associated with low basal metabolism, responded well to dietary restriction aided by thyroid extract. M. C., a female aged 22, showed a weight 125 per cent of standard on an apparently low calorie intake. Weight gain not due to increased food suggested an endogenous origin although the basal metabolic rate was only minus 4 per cent. The use of thyroid extract was followed by appreciable weight loss and disappearance of unnatural drowsiness.

Of special interest has been the group with colloid goiter associated with diminished basal metabolism (females in the post-adolescent period and also in the third decade of life); cases M. W., aged 17; M. R., aged 25; D. N., aged 21; E. T., aged 28; R. F., aged 24; E. B., aged 21; and A. P., aged 21. Symptoms have been chiefly lack of energy, weakness, and menstrual disorders. Thyroid extract tended to increase the physical efficiency of this group very distinctly; occasionally reduction in the size of the goiter was noted. Some of these individuals have not known vigorous health until check-up for colloid goiter with reduced basal metabolism indicated thyroid therapy. It may also be noted that such therapy became unnecessary after its use for a few months in one case (M. R., aged 25).

The basal metabolic rates have varied from minus 12 to minus 29 except in two cases minus 7 and 4 per cent. Rarely the diagnosis of thyroid lag has been made from the clinical features without reduction of the basal metabolism below the lower limits of normal. It may be assumed that such an individual's normal metabolism had previously been above the average normal limits and that there was actual lowering of metabolism. From the technical standpoint it should be mentioned that, with the apparatus now commonly in use, errors may occur on the minus side, although, if the patient's condition is not basal, the results will be above normal. With the common clinical usage of apparatus measuring oxygen consumption, the technical simplicity should not lead physicians to disregard errors that give inaccurate low results as well as abnormally high results. Leaks about attachments, ineffective valves, and inefficient absorption with soda lime may give inaccurate low results.

The dosage of thyroid extract, Armour's preparation, employed has seldom been less than 1 grain daily and at times given every other day. The amount has been controlled by clinical course and by the basal metabolism with chief emphasis upon the condition of the patient. Serial determinations of the basal metabolism have been of value in determining the dosage. But no common standard at which to maintain metabolism was set for all cases. Rather it was attempted to determine the level for each individual case.

In conclusion it may be stated that hypothyroidism challenges interest and attention in the limited fields of medical practice and illustrates the universality of physiologic processes. The specific conditions cited in this series of cases with hypothyroidism are alopecia, thinning of hair, abnormal skin pigmentation, sterility, dysmenorrhea and amenorrhea, narcolepsy, asthenia and lethargy, secondary anemia, obesity, asthenia and colloid goiter. In these conditions of changed functions and sometimes of changed structure, study should include the thyroid status, which if sub-normal gives gratifying response to the use of thyroid extract. Attention is also called to technical errors giving rise to false low reports and also to other factors, chiefly inanition, giving rise to reduced basal metabolism unassociated primarily with thyroid disease.

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TIBIAL FRACTURES INTO THE KNEE JOINT*

ARTHUR N. COLLINS, A.B., M.D., F.A.C.S.
Duluth, Minnesota

DESPITE the fact that the knee-joint is the largest joint in the body and that it has a multiplicity of ligaments entering into its structural support, it is still one of the weakest joints. Its vulnerability to attack by extrinsic forces as well as by intrinsic or perhaps torsion forces, places this complex joint in a most interesting light from the standpoint of trauma.

That the tibia receives a large share of the fractures of the lower extremity is well known and while fracture of the upper end of this bone is less common than of the lower end it is nevertheless serious in proportion to joint involvement. In Hartman's review of 335 cases of fracture of the leg, according to Barbilian, thirty-one were of the tibia alone and thirteen were of the upper end of the tibia (3.8 per cent), a much less frequent occurrence therefore than fractures of the other segments of the same bone.

The subject matter of the present discussion will be confined to a consideration of fractures at the upper end of the tibia, the fracture line entering the joint, or, as the French writers express it, fractures of the tibial plateau.

The range is extensive, from the simple one-line fracture, to that of comminution and many lines entering the joint; the fracture may also be compound. Now and then dislocation may be superimposed, though there were no dislocations in this series.

Twenty cases are herein presented, accumulated from the case records at St. Luke's Hospital, the fractures having been treated by other members of the staff and myself during the past four or five years. I wish here to acknowledge the courtesy and coöperation of those staff members who have aided me in this study.

Case 1.—A housewife, aged 68, while running for a streetcar, slipped on the ice and fell forward, striking her right knee. She was unable to walk. On examination she was found to have a comminuted fracture of the right tibia at its upper end, a wedge shaped fragment involving 85 per cent of the articular surface being displaced inward and downward but with the alignment fairly satisfactory. Reduction was effected and plaster cast applied. *X*-ray showed some improvement in the position of the fragment. Her convalescence was uncomfortable. She had continuous aches and pains in her right knee. However, she was up in a wheel chair on the ninth day and on the nineteenth day the record shows she was having less pain. On the twenty-fifth day the plaster dressing was replaced and on the twenty-sixth day she was discharged. The follow-up record shows that four months after the injury she was walking with a crutch and that she had dull pain in the knee, ankle and foot. She was bending the knee to about 50 per cent of the normal but was not yet doing her housework. She was using hot packs and massage for treatment.

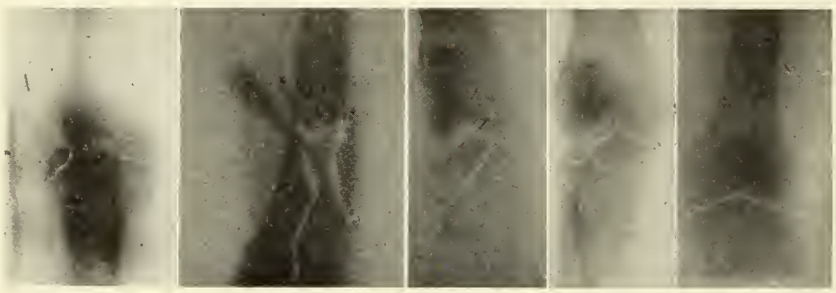
Case 2.—A man, aged 53, a collector by occupation, was knocked down by an automobile and was brought to the hospital in shock. Examination revealed a comminuted fracture of right tibia and fibula; also a fracture of left leg below the knee and a fracture at the left wrist. *X*-ray showed a comminuted fracture four inches below the knee joint with the fracture line running upward into the joint, slight displacement but perfect alignment. Supportive treatment only could be given on account of shock, and death occurred. Autopsy showed: (1) gangrene of the left foot; (2) cardiac hypertrophy (425 gms.); (3) passive congestion of the liver (2,300 gms).

Case 3.—A laborer, aged 37, while scuffling and in an intoxicated condition, sustained a fracture at the left knee. He was admitted twelve hours after injury. There was swelling around and effusion into the joint coupled with pain and inability to extend the knee; also tenderness over the medial proximal end of the tibia. *X*-ray showed incomplete fracture of the inner condyle of the left tibia starting above the condyle in the joint surface and running outward and downward but not reaching the outer border. There was no displacement. Treatment was not recorded and follow-up was not obtainable.

Case 4.—A housewife, aged 47, jumped from an automobile while it was in motion. *X*-ray showed a fracture of the outer condyle of the tibia of a compression type, i.e., a portion of the articular surface being pressed straight downward into the upper end of the tibia as though into a softer or pathologic area. Buck's extension was applied for three weeks and followed by a plaster dressing for three to four weeks. No motion was possible until removal of the plaster. The follow-up report three months later states the knee "is sore all the time"; she bends it very little and walking is difficult. Six months later there was a slight limp but no swelling although the knee was painful when she was fatigued. There was enough bending at the knee to allow going up steps but she found it difficult to go down.

*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, Minn., May 13, 1929.

Case 5.—A woodsman, aged 21, received an injury to his right knee when a log rolled off a sleigh against his leg. He was admitted to the hospital complaining of pain and swelling in the right knee and inability to walk on the leg. *X*-ray showed a wedge shaped fracture at the internal corner of the right tibia about 1.5 inches in each direction. Displacement was slightly outward and upward and the fracture line involved the joint surface. Treatment was by means of a plaster cast reaching to the mid-thigh. He left the hospital on crutches in the fifth week. Follow-up was not obtainable.



Case 1 Case 2 Case 3 Case 4 Case 5

Case 6.—A housewife, aged 54, received an injury to her left knee in an auto accident (no details). *X*-ray showed a simple fracture through the upper part of the left tibia, the fracture line running obliquely upward and forward and entering the joint. The fragment was in perfect position. Treatment consisted of plaster encasement from the ankle to the groin. This was painful and the plaster was replaced. Crutches were allowed on the fourth week. The cast was removed in the sixth week. The follow-up three months later states there was knee stiffness, that the bending was about one-half normal but also that the swelling was troublesome and weight-bearing difficult.

Case 7.—An attorney, aged 50, fell with his automobile over a forty-five foot embankment. He was admitted to the hospital with a compound comminuted fracture of the left tibia, at least five fracture lines running up and down through the upper end of the bone, one line entering the knee joint between the crucial ligament attachments. There was slight outward angulation. His treatment consisted of Buck's extension with weights and plaster casing on the thirteenth day. He was doing some weight bearing in the ninth week. A follow-up obtained four months later stated he had swelling and stiffness and some limping but was improving. Eight months later there was still some limping but no pain. There was some swelling when he was up and about. He could then bend the knee sufficiently to walk and was back to his work at the end of six months.

Case 8.—A janitor, aged 42, was knocked down by an auto, was run over and was picked up unconscious. On admission, there was no deformity but some swelling at the right knee. *X*-ray showed a comminuted fracture of the right tibia (also fibula). There was slight posterior angulation of the upper fragments of the tibia and the fracture line entered the joint. Incidentally there were also compression fractures of the seventh and eleventh dorsal vertebræ. Splints were applied at first and plaster dressing a week later. He was up in a chair in the eighth week and was then discharged. Follow-up report a year and a half later states there was some stiffness of the knee but no swelling. There was no bending for a year but at the time of the report he had about half normal flexion of the joint. He returned to work the fourth month after injury.

Case 9.—A landscape gardener, aged 63, fell off a ladder, injuring his left knee but was not admitted for *x*-ray until two weeks after the injury. At this time the *x*-ray showed a fracture of the outer condyle of the left tibia with the fracture line running upward into the joint. Callus formation was visible in the film and evidence of an hypertrophic arthritis. He was placed in plaster for five weeks and was allowed up on crutches in the fourth week. Follow-up records that two years later he was walking but had swelling in the knee and some pain and stiffness.

Case 10.—A watchman (formerly a blacksmith), aged 63, was struck by an automobile while crossing the street. *X*-ray showed a complete fracture of the internal tuberosity of the left tibia, the fracture line running into the joint. Reduction was done under general anesthesia and plaster applied. This was followed by distress from swelling and pain and a new cast was applied. He remained in the hospital nine days. The follow-up report obtained three and a half years later stated there was pain and swelling and stiffness and he was not able to work.

Case 11—A man, aged 59, was knocked down by an automobile. On admission, the *x*-ray showed a compound, comminuted fracture of the upper end of the right tibia, two of the fracture lines running into the joint. There was also a fracture of the left fibula. Reduction was done in two hours but an anatomical reposition was not obtained. The plaster case was removed on account of the poor position and Buck's extension and a Thomas splint with a fifteen pound weight were applied. Plaster dressing was delayed until the eighth week because of the open wound. He was on crutches by the fourteenth week and at that time was able to flex the knee to a right angle. He left the hospital at this time. A follow-up report four

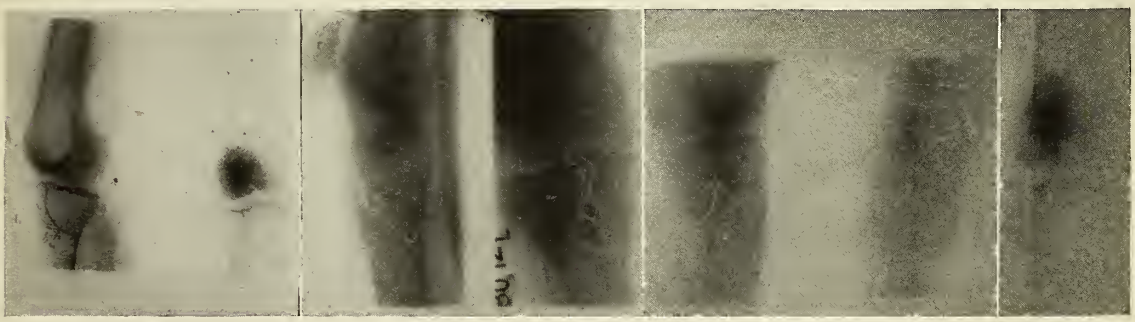
years later stated there was stiffness but no swelling and that he has not worked since his accident.

Case 12.—A man, aged 60, a clerk by occupation, was struck by an automobile and knocked against a fence, He was picked up unconscious, but consciousness had returned at the time of admission to the hospital. There had been no vomiting. There was loss of motion of the left leg and swelling at the left knee. *X*-ray showed a fracture of the left tibia just below the condyles. The fracture was complete and transverse; there was slight displacement and the fracture line ran upward into the joint. The leg was placed in a Thomas splint and on the tenth day a plaster cast was applied after gentle manipulation. Immobilization was maintained for eight weeks and he was then discharged, at which time flexion to 45 degrees was possible. He had moderate pain on motion. Follow-up was not obtainable.

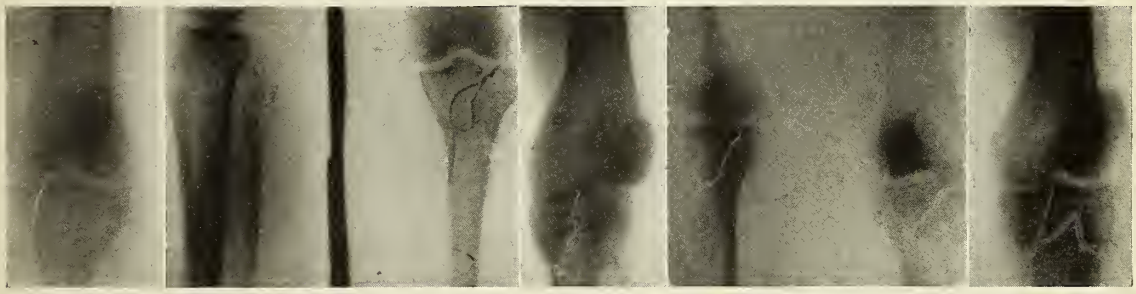
Case 13.—A woodsman, aged 43, had his right leg struck by a swinging log. He was admitted to the hospital with swelling at the knee and effusion into the joint. *X*-ray showed a comminuted fracture of the upper end of the right tibia, the fracture line running upward into the joint. A Thomas splint was applied with extension and 45 degrees of elevation. A moulded plaster splint was applied on the third day. Slight bending to an angle of 15 or 20 degrees was allowed in the second week, and the leg was returned to its splint. The plaster was removed on the twenty-seventh day and crutches were allowed on the thirty-sixth day. Follow-up three months later states he had good anatomical and functional result. Five months later he had returned to work driving a team. Two years later he noticed no difference in function as compared with the uninjured knee. There was no limp, swelling or pain.

Case 14.—A blacksmith, aged 42, was kicked by a horse and thrown down while shoeing the animal. He was admitted with excessive swelling at the left knee and effusion into the joint. *X*-ray showed a comminuted fracture of the left tibia with the fracture line running into the joint. The fragments were fairly well related to each other. A Thomas splint was applied with extension and with 45 degrees of elevation. The ecchymosis gravitated into the thigh with compensatory reduction of swelling at the knee. A moulded plaster posterior splint was applied in the fourth week and crutches were allowed. The knee was bent under ether in the tenth week. Weight bearing was allowed in the ninth week. Follow-up report four months later stated the patient was walking without crutches; seven months later he had returned to work shoeing horses; eight years later he had good function, no limp but slight stiffness in the left knee. He had no swelling but there was slight pain if he straightened the leg quickly. He noticed an ache in bad weather and noticed the left leg tired more easily than the right. Motion was 50 per cent or better.

Case 15.—A clothes peddler, aged 72, was injured in an automobile accident, no details of which were given. *X*-ray examination on admission showed a wedge shaped fracture of the external condyle of the left tibia with displacement outward. His leg was placed in a Thomas splint with Buck's extension. Plaster dressing was applied on the fourth day. He was up in a wheel chair in the third week and the cast was re-



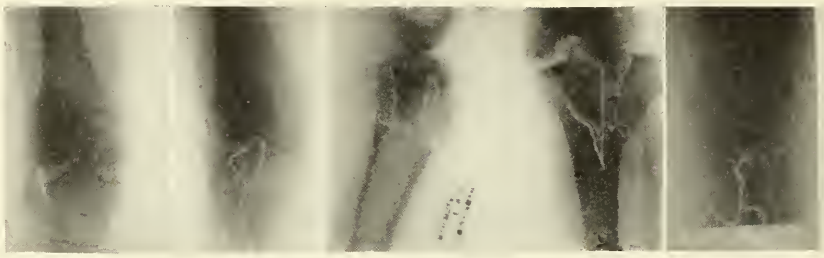
Case 6 Case 7 Case 8 Case 9



Case 10 Case 11 Case 12 Case 13 Case 14

moved in the fifth week. Crutches were allowed in the seventh week and at this time physiotherapy was begun. He was discharged in the eleventh week. Follow-up obtained a year later states he was walking; there was slight pain but no swelling and he had 75 per cent flexion. He was able to work in four months.

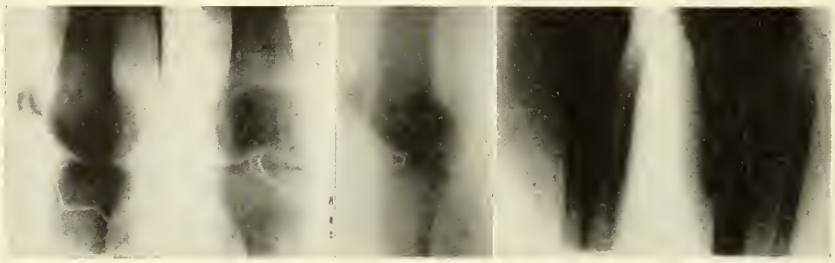
Case 16.—A housewife, aged 66, stepped out of an automobile, turned her ankle and fell, injuring her right knee. She was unable to walk and was admitted one hour later with much swelling at the right knee. *X*-ray showed an incomplete longitudinal fracture of the upper end of the right tibia with the fracture line extending downward from the joint for about an inch. There was no displacement of fragments. A plaster dressing was applied in three days but the knee continued to be painful and the cast was cut open and strapped together. She received massage beginning on the tenth day and was discharged from the hospital on the fifteenth day. A follow-up obtained two years later states that there was no trouble with the knee and that she was walking well.



Case 15 Case 16 Case 17 Case 18

Case 17.—A printer and dancing teacher, aged 29, was kicked down an embankment by a horse. He couldn't get up and was brought to the hospital two hours after injury to the left knee, where there was much swelling. *X*-ray showed a comminuted fracture of the upper end of the left tibia. The largest fragment consisted of the entire outer condyle, which was displaced outward. The smaller fragments lay between the outer and inner condyles and were in fairly good position. The entire upper end of the tibia was displaced outward. A Thomas splint was applied and extension with an eighteen pound weight. The leg was elevated on the splint to an angle of about 45 degrees to reduce the swelling at the knee. Plaster dressing was applied on the twelfth day and was bivalved. Motion was encouraged on the twenty-fourth day. The knee was bent under anesthesia in the seventh week. He was bending his knee to a right angle in the eighth week and was doing some weight bearing in the ninth week. Follow-up three years later states that motion is equal to that on the opposite side and that he won a dancing contest eight months after injury. He had no swelling or stiffness.

Case 18.—A housewife, aged 63, fell while standing on a stool. *X*-ray on admission showed fracture of the internal condyle of the upper end of the right tibia. The fragment was displaced upward and included both tubercles. The fracture line entered the joint. The leg remained in plaster dressing for five weeks, after which weight bearing was allowed. A follow-up obtained four years later stated that she walked without limp. For two years there was some pain, which, however, had disappeared. The joint was a little thicker but did not swell. There was some limitation of motion but she abandoned her crutches at three months and did light housework at six months after injury.



Case 19 Case 20

Case 19.—A laborer, aged 42, was knocked down by an automobile, which also ran over him. He received injuries to both knees and was admitted to the hospital in condition of disorientation and with mumbling speech. *X*-ray showed: (1) a fracture in the articular surface of the right tibia toward the inner side, the fragment being wedge shaped with the point inward and the fracture line entering the joint; (2) also a fracture involving the entire inner condyle of the left tibia. The fracture line began about 4 cm. below the joint and ran upward into the joint at the intercrural space. The fragment was in perfect position. Details of treatment not given except that he was getting about on crutches at the time of follow-up. The follow-up five months later stated the right leg functioned

normally. The left however caused him to limp and in this knee he had pain. He had swelling on this side also but an attack of typhoid earlier in his life, followed by phlebitis in the left leg, was regarded as a factor in causation of the swelling. Flexion at the left knee was limited to 45 degrees. He had not returned to work.

Case 20.—A man, aged 56, a clerk by occupation, fell from a ladder while working on a roof. He was admitted five hours later with swelling at the right knee and lateral hypermotility. *X*-ray showed a comminuted fracture of the upper end of the right tibia (also the fibula) with at least two or three fracture lines running upward into the joint. There was moderate separation of the fragments from the shaft of the tibia with a slight backward displacement and angulation. The leg was placed in a Thomas splint with Buck's extension and no weights. A Hawley pin was placed in the heel for skeletal traction. Anatomical position was satisfactory, the temperature was normal and there was no evidence of infection at the time of report. The patient was still in the hospital.

Of the causes producing these injuries, we see on tabulation that the automobile was responsible for eight of twenty (40 per cent). There was no other one cause which approximates this percentage, the next in line being 10 per cent, several different types of accidents producing this percentage.

TABLE I

Causes of Injury:	
1. Knocked down by auto	5
2. Auto accident (no details)	3
3. Struck by swinging log	2
4. Twisting injury	2
5. Kicked by horse	2
6. Fell from ladder	2
7. Fell from stool	1
8. Fell with auto from height	1
9. Jumped from height	1
10. Fell, striking knee	1

The injury is one quite evidently threatening those past forty years of age. In these twenty cases all but three were over forty years of age (85 per cent). Men, according to this group, are three times more likely to have the injury than women. There were fifteen men and only five women listed here.

TABLE II

Ages	42,	63,	29,	66,	72,	42,	43,	60,	59,	63,	63,	42,	50,	54,	21,	47,	37,	53,	68,	56
Sex	M	F	M	F	M	M	M	M	M	M	M	M	M	F	M	F	M	M	F	M
Right or left	RL	R	L	R	L	L	R	L	R	L	L	R	L	L	R	R	L	R	R	R

Both knees were about equally involved, inasmuch as ten of the injuries were of the right knee and nine of the left, while in one man, both knees were injured. This man with both tibiæ fractured into the joints, is, so far as I have been able to find, the only case of this type recorded to date.

None of the cases in this series were treated by open operation and it is a striking and important fact that there are no cases of non-union recorded nor to be found in the follow-ups. This is an interesting disclosure of fact and should afford those treating fractures at the upper end of the tibia courage in instituting early motion. The rich and plentiful blood supply in the cancellous tissue at the upper end of the tibia favors early union, and if the fracture is not compound little fear of infection need exist.

The following table gives in brief the result of treatment.

TABLE III

	Cases
Unclassified	6
Cases untraceable, dead, or still in hospital or under treatment.	
Poor	2
Fair	5
None of these cases received early motion.	
Good	7
Six of the seven cases in this group received early motion or manipulation or massage or all three. In two cases the knee joints were bent under anesthesia.	

There is undoubtedly significance in the fact that fractures in this region heal well. There has been no instance of non-union. Those cases treated by early motion, massage and manipulation have had the better results.

The Thomas splint is a convenient apparatus in which to transport the patient to the fluoroscopic table where comminuted fragments may be moulded into position. It may be employed in conjunction with Buck's extension.

Barbilian in a comprehensive article reported ten cases and summarized the French literature. The cases he reported were all over forty years of age. He calls attention to the age incidence, which is at a time when the bony elasticity begins to lessen. However, these fractures may be produced earlier in life. Tedenat reported a case occurring at eighteen years (Heidenreich). My cases were equally divided between men and women, whereas Grimbel found the occurrence almost three times as frequent in men as in women.

Barbilian states that fracture of one tuberosity is more frequent than fracture of both but is nevertheless rather rare. In 1916 Tanton could collect only sixty-three published cases. Fractures of the tibial plateau are only a variety. They are interesting on account of their gravity rather than on account of their frequency. Heidenreich in 1877 collected thirty-nine cases, this being the first complete and well founded work on these fractures of the upper end of the tibia and even today is a classic.

These fractures occur more frequently in winter because of the greater frequency of trauma. The internal tuberosity is a little more often involved, according to Sonntag; twice as frequent according to Bossi.

It is difficult to decide whether the lesion results from the shock produced in falling or from tearing by muscular contraction and pulling on the part of the ligaments. Fracture by direct blow is becoming more and more frequent, due to the greater speed of vehicles, which render trauma more frequent and more violent. Further, one may say that with advanced age one may think of an indirect mechanism, while the younger the individual the more one should consider direct trauma.

Direct fractures are produced by a blow at the superior extremity of the leg: the kick of a horse, crushing by the wheel of a vehicle, a fall down stairs, a fall on the bone itself, etc. In a fall, the instinctive tendency is to touch the ground first with the external side of the foot. This results in abduction of the knee, bringing the articulating surfaces of the internal side closer together; the greater impact is thus at this point.

Barbilian and his co-workers have never been able to obtain true fractures by simple internal or external torsion of the knee joint experimentally. Only small tears resulted in compact tissue. However, if to a certain degree of torsion or of lateral flexion there is added a direct blow at the level of the superior external side of the tibia a fracture could be produced. The force necessary is still much less when there is torsion. This proves that in exaggerated positions, the resistance of the bone is diminished. Without excluding entirely the mechanism of tearing we believe we must admit a mixed mechanism; direct and indirect at the same time.

Segons obtained fractures of the tibial plateau itself experimentally by simple forced extension in a subject with a rarefied osseous system.

Symptomatology: At the time of the accident the patient feels a very sharp pain but, felled by the blow, is not always conscious of the crepitation of the fractured bone. Functional impotence is added to the pain which every attempt at movement makes worse. The intra-articular effusion of blood infiltrates the soft parts, distends the knee, rising to mid-thigh and descending into the leg. Ecchymosis soon makes its appearance. Its site and limits may be very extensive, is variable, but the infiltration tends to descend and thus become more intense in the popliteal space. The coexistence of this popliteal ecchymosis and the articular swelling should then always indicate a fracture, either tibial or femoral. Deformity should also make one think of a grave lesion. The partial flexion of the leg on the thigh is observed in almost all cases. More important, but less frequent, is the deformity of valgus or varus, according as the external or the internal tuberosity is involved. The valgus knee is observed not only in almost all cases of fracture of the external tuberosity but also in those of the internal tuberosity. To these deformities may be added subluxation of the leg outward by the gliding inward of the femoral condyle and the external rotation of the leg. Relative shortening will occasionally occur.

A symptom which always exists, but which is more or less marked according to the degree of displacement of the fractured segment, is widening of the tibial plateau. This may be noticeable in the absence of effusion but difficult to make out in the presence of effusion. Palpation may permit one to localize the site of fracture. However, great effusion on one side and sharp pain on the other may render palpation very unreliable. A clear, painful line or a palpable groove may correspond to the fracture line in the bone. Mobility of a fragment may be palpated if its fibrous coat is torn. Barbilian states that crepitation is rare because the spongy tissue is unfavorable to its production.

X-rays should always be used to determine the variety of the lesion and to find out the relation of the fragments.

A severe sprain of the knee could be mistaken for a fracture of the tibial plateau; it could indeed present the grave signs of a fracture—intense pain, swelling, functional impotence; but

widening of the tibial plateau and popliteal ecchymosis associated with swelling will eliminate a diagnosis of sprain.

Prognosis: Fractures of the tibial plateau are grave fractures because they are articular. Loss of function in the knee, total or partial, is to be feared. In general, even in the most fortunate cases where complete integrity of function is restored, this is often not realized for a year and a half or two years.

Complications: The most formidable of complications is without question the occurrence of a compound fracture. Late complication is retardation of union which may end in false articulation. Among functional complications the most important is poor recovery of movement, which may amount to ankylosis. Articular function may be impeded by a deforming callus, by lateral motility or by a deformity. Rather often a chronic arthritis supervenes.

Treatment.—1. Orthopedic: This consists of (a) early evacuation of hemarthrosis; (b) reduction of fracture; (c) immobilization for a month; (d) massage and later, mobilization until complete recovery.

2. Surgical: reduction of fracture by arthrotomy through one of the classic procedures and maintenance of the reduced fragments by a definite fixation. Immobilization is of very short duration and is followed by massage and mobilization.

Surgical treatment has not proven the superior method. The spongy bone does not lend itself well to osteosynthesis. Moreover the general state of the patient often does not warrant any surgical procedure. Once accomplished the immediate results of surgical treatment are often more satisfactory but the end-results are not exempt from grievous consequences. Metallic prosthesis is not well tolerated in many cases and infection, which of all complications is to be avoided, may result. In some cases a second intervention is necessary for the removal of the metal.

Non-surgical treatment (orthopedic):

If a perfect anatomic restoration is not always realized by the orthopedic method, a satisfactory function is usually easily obtained.

If the orthopedic method is slower, it is surer.

Articular atrophy and stiffness accompanying the orthopedic method may be lessened, in large measure, by early massage and mobilization, with expectation of their ultimate disappearance.

Without eliminating surgical treatment Barbilian reserves it for cases where there is great displacement and serious ligamentary tears.

The cases in the Barbilian report show that very satisfactory recovery can be obtained by the orthopedic method and that this method involves less risk.

Desgouttes and Ricard report four cases treated by a simple reduction and immobilization in the cast; results being as good as those obtained by other methods. These writers insist on the fact that the two tuberosities of the tibia have very unequal importance in the equilibrium of the knee, the role of the internal being more important. Fracture of the internal even with slight displacement will be grave, whereas fracture of the external, even accompanied by great displacement, will react but little on articular equilibrium.

These writers urge more frequent use of a simple cast without abandoning necessary surgical means, but they state we hope to accomplish too much by surgery. After-results, which *x*-rays and examination of the patient do not permit us to hope for, are obtained by simple immobilization.

Dehelly presents a case to show the use of the bone graft and to call attention to immoiblization of the leg in flexion in fractures of articulating extremities. He uses partial flexion more and more and regards the results as to mobility as excellent. He feels that when the leg is immobilized in extension almost complete rigidity of the knee often results.

Swete-Evans reports a case of tibial fracture occurring in a private twenty-four years old who while playing Soccer fell with knee bent as his opponent sprang up and came down on the outer side of the patient's thigh just above the knee. The *x*-ray showed a vertical T-fracture from the knee joint on the outer side of the crucial ligaments three to four inches down the shaft of tibia with pieces of bone and semilunar cartilage or meniscus wedged in the fissure. Treatment was surgical. Arthrotomy was performed and blood and mashed bone expressed; screws were inserted; a McIntyre splint applied; postoperative shock occurred, but recovery. Progress for one year, satisfactory: "will be able to return to military duty."

Cubbins, Conley and Seiffert report two cases of fractures of the lateral tuberosity, the fragments widely heparated and the meniscus separated from its lateral attachment and displaced downward between the fragments. Open operation was necessary in order to dislodge the meniscus and approximate the fragments. The meniscus was sutured back in place. Careful passive motion was begun in two to four weeks. A removable cast was used as support for eight weeks.

Moreau reports twenty-two cases: nine of fracture of the external condyle, two of the internal, five of both condyles and four gunshot fractures of the external and two of the internal condyle. The symptoms were dominated by hemarthrosis and swelling; suffusion of the limb was not a constant sign. Crepitation and abnormal mobility of the fragment were usually absent. There was absolute functional impairment and weight-bearing was impossible. Joint-puncture was usually employed and sometimes repeated. In one case Willems treatment was instituted. All cases were immobilized in splint or plaster. After a number of days, varying with the joint, massage and active exercises were added. Results: two very good results, without valgus deformity, good motion two months after puncture, compression bandage, continued traction. Two excellent results after one month from puncture and Willems treatment. After simple immobilization; one normal, one satisfactory functional result with slight and moderate genu valgus; three very good functional results without deformity. In five cases of fracture of both condyles, plaster immobilization without puncture; in two cases traction was applied. Results were satisfactory though not so good as single condyle fracture.

SUMMARY

In this serious type of fracture the automobile is responsible in twenty cases for 40 per cent of the injuries and in ten other cases for 30 per cent, an average of 36 per cent. The injury occurs chiefly in men forty years of age or over. Barbilian has shown that a combination of torsion and direct trauma are for the most part responsible for this type of injury.

Two cases of sunken or compression fracture are recorded; one of the writer's series of cases and one reported by Dehelly.

Two cases of spreading or T-fracture with a semilunar cartilage or meniscus wedged in the fissure are recorded; one by Swete-Evans and one by Cubbins and his associates.

Some writers insist that the internal tuberosity is the more important from a functional standpoint and should be conserved more cautiously than the external.

Barbilian mentions delayed union or non-union as a late complication, but the writer finds no reports of this nature and is inclined to believe, on the contrary, that these fractures heal well, owing to the cancellous bone and rich blood supply.

Early motion in a series of twenty cases is seen to be coincident with the best results, judging by the follow-up reports.

Surgical treatment is reserved for the occasional or exceptional case of gross deformity and ligamentary tears.

The weight of opinion leans to conservative or orthopedic treatment rather than surgical intervention. While a perfect anatomic restoration of position is not always realized by the closed method, and while it may be slower, it is surer.

The writer wishes to emphasize in the closed method:

1. Elevation of the extended leg to a sharp angle (30 to 45 degrees) to rapidly reduce swelling at the knee.
2. Puncture if excessive intra-articular effusion.
3. Buck's extension on Thomas splint.
4. Massage after the first week.
5. Early motion second to fourth week.
6. Removable plaster during the third or fourth week for support and to facilitate treatment.

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EXPERIENCES IN THE USE OF THE SULPHOCYANATES*

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In recent years there has been decreasing in the medical mind the feeling that hypertension be considered a phenomenon compensatory to structural vascular change, and there has been an increasing knowledge of factors suggesting that it is a primary result of an unknown cause, producing a variety of degenerative changes. Thus Moschowitz[1] has recently strikingly pointed out the relation of arteriosclerosis to increased vascular tension, and the secondary kidney and cardiac results of this condition challenge us to search for measures to combat its underlying cause. While the etiology of hypertension is still unknown, the arteriolar spasm associated with it is well recognized as being for a long period its immediate inciting cause (the etiology of spasm being still undetermined), and the wide search for remedies has resulted in the study of a number of drugs, from the long known nitrites to the recently tried watermelon seed extract, most of which probably act by relief of vascular spasm, with varying results. These observations make evident the encouraging results possible in this form of therapy, the rationale of which is seen in the probable postponement of the secondary cardiovascular and renal complications which are so often the first to call the patient's attention to his condition.

Of the many drugs used, the sulphocyanates were first found to be effective in this condition in 1903 by Paul,[2] who in experiments comparing the action of iodides with these drugs noted the reduction of blood pressure obtained and used it with success clinically. There appears little further in the literature regarding this therapy until 1924, when Westphal[3] called attention to rather remarkable results which he was obtaining with it, only three of thirty-five cases resisting treatment. Since then it has been fairly extensively used in Europe, with few reports from this country. Nichols[4] has given it a thorough study and extensive clinical trial with excellent results. Kramer,[5] Gager,[6] Palmer and Sprague,[7] and Logefiel[8] have reported results chiefly favorable. It was with these in mind that we decided to give the drug a trial on our Ancker Hospital and Dispensary services, and this report covers our experiences with its use in twenty-four cases. It is not with the purpose of drawing definite conclusions from so small a series that this is presented, but rather with the hope of demonstrating the effectiveness of the drug in reducing blood pressure, and especially to point out the variable dosage necessary in different individuals to obtain a result and the possible unfavorable side effects associated therewith.

In this group were eighteen women and six men, ranging from fourteen to seventy-five years of age, with no significant variation in result associated with either factor. There were sixteen dispensary patients and eight hospital patients, the latter, even though ambulatory, securing an average systolic drop of 8 mm. Hg. more than the former, this difference, however, being eliminated after the patients left the hospital.

Following the recommendation of Nichols, backed by an extensive trial, we decided to use the sodium salt, although it was necessary with the first few patients to use the potassium salt with which many had gotten excellent results. Hospital patients were kept in bed about one week and all were given sodium bromide for at least this period to effect any sedative action possible in reducing the pressure. Dispensary patients were permitted to rest ten minutes in the dorsal position before the pressure was taken. Pressures to be given are the averages of at least four consecutive readings with comparatively short intervals between them.

In accordance with Nichols' experience, and contrary to the advice of others, we started with a five grain dose three times daily, but in four of five patients untoward side effects necessitated discontinuance of the drug. Later patients were started on two grain doses, and if no result was obtained in a week to ten days, were given increasing doses, the largest being ten grains. The medicine was continued one to four weeks after a maximal drop was obtained. Four patients were given the potassium salt, eighteen the sodium salt, and two received both salts on sep-

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arate occasions, without any noted difference in the results obtained.

Twenty-two, or 92 per cent of our patients, showed systolic pressure drops varying from 15 to 150 mg. Hg. with the majority obtaining very substantial reductions, the largest group of patients being the seven who showed 50 to 60 mm. drops. Fifteen, or 62.5 per cent, showed diastolic reductions, usually above 20 mm., the greatest being in our youngest patient, where a drop of 100 mm. was obtained.

Only two of the groups failed to show an average systolic pressure reduction, one of these being a tertiary luetic who later developed a substantial reduction on specific therapy, and the other a man with severe kidney damage who could not tolerate our minimal dose. Nine cases, however, had no average diastolic reduction, and there were no particular factors with which this could be associated.

The maximal drop in pressure was recorded at varying times after starting the drug in different individuals, some showing it at three days, others requiring a month, the average being about two weeks. Those requiring the longer time usually took larger doses, the step-up in dosage being made at seven to ten day intervals. Once the pressure was being held down for about a week the drug was discontinued and the lowered pressure was found to persist from a few days to two months. Those who were followed sufficiently long were usually found to respond again on resuming medication. When a result was being obtained it was noted that overexertion, and domestic, economic and other worry would cause sharp temporary rises in pressure in spite of the medication, a rather frequent situation in the class of patients studied, and it emphasized the importance of the psychic factor and the difficulty in obtaining results where uncontrolled.

Twelve of the twenty-four patients complained of symptoms associated with hypertension, chiefly headache, vertigo, tinnitus, weakness, dyspnea, and abdominal distress. Of these, six were completely relieved of severe headache, five had marked relief and one no relief. This relief, when obtained, was obtained within the first ten days, further medication failing to enhance it.

On the other hand, thirteen developed unpleasant complications. Of these, eight complained of marked weakness, chiefly of the legs and arms; some had vertigo. With the onset of such symptoms the drug was discontinued, and after a few days all were relieved of these effects which had been produced on dosages varying from two to ten grains t.i.d.; only one, however, on the minimal amount. This experience was in accord with that of others, but far more striking. One patient developed a severe distressing erythema with intolerable itching which persisted about ten days after the drug was stopped but there was no desquamation as in the only similar case found in literature, that reported by Weis and Ruedeman.[9] It suggested very much the early form of lesion seen in dermatitis exfoliativum. Most disturbing, however, was the development of toxic psychoses in four patients, with disorientation, hallucinations of sight and hearing, mania, confusion, and ideas of persecution, singly or in combination. Such diagnoses were verified by psychiatric consultation. These caused considerable concern when they appeared, but they lasted only five to seven days after the drug was stopped. They were all in patients to whom it had been necessary to give from seven to ten grains t.i.d. to obtain a desirable reduction, and it is to be noted that as a group they showed the greatest lowering of pressure of the series. It was interesting also that this group maintained a considerably longer period of lowered tension after the cessation of symptoms, without medication, than the rest, all being much more comfortable and free from symptoms for three weeks or longer. These manifestations were always preceded by complaints of weakness, but excepting in one case, were in hospital patients, resting a great part of the time and calling little attention to it. The ambulatory case was one of our first patients in whom we were not certain at first as to the significance of the weakness, the later experience with which made us proceed more cautiously with the drug.

Retinal examination was made in over half the cases, all showing moderate degrees of arteriolosclerosis, and two with hemorrhages and exudates, but there was no relation between these findings and the results obtained.

Urinary examinations were all negative except of one elderly patient with much albumin and many casts and pus cells, who later came to autopsy revealing an old extensive urinary tract infection. Phenolsulphonephthalein tests were performed on twelve of the twenty-four cases with greater than forty per cent elimination in two hours in ten cases. In these there

was no constant relation to the degree of response, practically all having marked pressure reduction. Of the other two, one case with no elimination of the dye in two hours obtained no pressure reduction, and the other with a twelve per cent two hour elimination secured a systolic reduction of 50 mm. Hg. and no diastolic reduction. Obviously there was insufficiently advanced renal impairment in this series to draw any conclusions as to a relation between renal function or urinary tests and the result to be expected, although a substantial reduction was obtained in two cases with undoubted advanced renal damage.

Blood examination revealed a moderate secondary anemia in four cases, all of which responded to the sulphocyanate therapy. One patient who obtained no result from the drug had a positive Wassermann reaction and later obtained a drop of 30 mm. Hg. systolic, 18 mm. Hg. diastolic on mercury salicylate medication.

Blood chemistry examination in thirteen patients gave normal values except in one instance, this being a girl of fourteen years, who showed the largest drop in pressure of the series. She showed a urea of 34.3 mg. per 100 c.c., which was reduced under therapy to 26.6 mg., with a corresponding improvement in phenolsulphonephthalein excretion from 34 to 55 per cent in two hours.

Electrocardiograms were done on all patients, fifteen of the twenty-four showing evidences of myocardial damage as shown by T-wave inversion, arborization defects, P-wave abnormalities and arrhythmias, but study revealed no relation of these signs to results obtained from sulphocyanate therapy.

Our experience with the youngest patient, a girl of fourteen years, was sufficiently interesting to warrant a short summary. This child, anemic, markedly emaciated, weighing fifty pounds, was admitted to the hospital complaining of weakness and vaginal hemorrhage, which she had considered the beginning of her menstrual periods, a loss of weight of ten pounds, and failing vision. She also had dyspnea on moderate exertion, nocturia, and headaches of about seven years duration. Examination revealed a moderate cardiac enlargement, low palpable kidneys, marked arteriolosclerotic retinæ with hemorrhages and exudate, markedly sclerosed and tortuous radial and brachial arteries, and a blood pressure of 252 systolic, 180 diastolic. She was found to have no vaginal hemorrhage, a normal pelvis, and a markedly bloody urine. Cystoscopic examination showed the blood to be coming from the left ureter, which was shown by the pyelogram to be greatly dilated, and capped by a bifid pelvis with irregularity of the minor calyces. Repeated observation by urologic consultants failed to bring out a diagnosis of the renal condition. After an initial period of observation she was put on sodium sulphocyanate, five grains three times daily. Within the next ten days she had an initial drop of 80 mm. systolic, 65 mm. diastolic, pressure and the hematuria stopped. This dose was kept up three weeks with marked improvement, the patient feeling well. Hoping to further reduce the pressure, the dosage was increased to 7.5, then to 10 grains, on which she soon developed a convulsion, followed after two days by a toxic psychosis which lasted four days. Associated with this she had an additional drop of 70 mm. systolic, 35 mm. diastolic, which persisted after the clearing of mental symptoms, without medication, which was stopped at the time of the convulsion, during the following month, after which she was discharged, having shown a marked improvement in the anemia, a gain of twenty-seven pounds in weight and having no complaints whatever. We have been unable to follow her since but have learned indirectly that she has had a mastoid operation recently and that her pressure is now back to 200 systolic, it being five months since her discharge. She has had no sulphocyanate since that time.

The other patients developing a psychosis, adults of middle age, two women and one man, all had premonitory weakness preceding the mental symptoms which persisted five to ten days. These patients had systolic reductions of 53, 55, and 55 mm. respectively, and diastolic reductions of 22, 23, and 28 mm. respectively, persisting three, six, and six weeks after the relief of the psychosis. These were the only patients receiving a maximum of five grains, in which cases no psychosis developed.

DISCUSSION

This small series of cases has been of interest to us because it has represented the panorama of development in our knowledge of the sulphocyanates. It has revealed that the drug produced a definite drop in systolic pressure in 92 per cent of the cases, and in diastolic pressure in 62

per cent. Concomitantly it reveals that these drops are not to be obtained without the risk of unpleasant side effects if the drug is to be used in effective dosage. On six grains daily ten of twelve patients secured an average reduction of 30 mm. systolic (only five securing diastolic reductions, averaging 14 mm.). Of these, four developed marked weakness, showing that even with minimal dosage the drug is not without unpleasant side effects. These increase as the dosage is increased, all patients receiving over five grains t.i.d. being affected, with a very real danger of developing a toxic psychosis, which occurred in four of five such patients. It is not possible to say to what degree the possibility of cumulative effects of the drug may enter into the explanation of these symptoms, as no studies of excretion were made, but these observations are very suggestive of it. However, the rapid improvement of those developing toxic psychoses together with the long periods of maintained pressure reduction suggest that some other factor may explain its prolonged effect. The psychoses were quite alarming, being preceded and accompanied by a marked degree of weakness. However, their duration was not long and unusually good results followed in the reduction of blood pressure and general improvement in the patients' condition.

CONCLUSIONS

Recognizing the futility of drawing conclusions from a small observation experience, the following may be better presented as supported impressions.

1. The sulphocyanates are effective in a high percentage of cases in reducing blood pressure.

2. The majority of patients will secure a reduction of pressure on minimal dosage, 6 grains daily, a greater lowering of pressure being obtained by increasing the dosage, but only by raising the risk of securing unpleasant side effects; larger doses, therefore, must be used with extreme caution.

3. Side effects manifest themselves in weakness and dizziness progressing to symptoms of psychosis, as disorientation, hallucinations of sight and hearing, ideas of persecution, and mania.

4. These side effects do not long persist after the drug has been stopped, and leave no after-results.

5. Patients developing side effects on the whole receive more satisfactory pressure reductions than those who do not.

6. More than 90 per cent of patients having symptoms probably caused by hypertension are completely or markedly relieved by sulphocyanates.

7. The lowering of blood pressure effected by sulphocyanates persists considerable periods of time, up to two months after the drug is stopped, and is explained either by cumulative effects of the drug, or, more likely, some persistent effect on vascular tone.

8. Factors of sex, age, retinal pathology, urinary findings and tests, myocardial damage as shown by the electrocardiogram, heart size or outline as shown by the *x*-ray, and blood examination as to chemistry, and cytologic and serologic tests revealed no relation to the result obtained which would influence therapy or expected response at all.

9. It is to be emphasized that while the sulphocyanates are efficient drugs to be considered in the treatment of hypertension, they should only be employed where the patient is under sufficient observation so that the administration may be easily controlled, realizing the possibilities of unpleasant side effects which attend its use.

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PERNICIOUS ANEMIA IN THE YOUNG*

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THE occurrence of pernicious anemia during childhood or infancy is perhaps worthy of renewed discussion for reasons other than statistical curiosity. As a result of the intensified studies which have followed the discovery by Minot and Murphy, it is becoming clearer that blood morphology in obscure cases, even when studied by experienced morphologists, is not sufficient for the differentiation between pernicious anemias and anemias of other types. This statement is supported by the views held by Downey,[2] that the red blood cells alone present no pathognostic morphological picture in pernicious anemia. This apparently is particularly true of anemias during early ages. Further, it is clear that the presence of a well established achlorhydria (histamine test) does not help in the differential diagnosis since achlorhydria is frequently found even in cases of unquestionable hypochromatic anemias. This, of course, does not alter the fact that a diagnosis of pernicious anemia with a persistent gastric secretion of hydrochloric acid might be doubted. Further, it is possible to state that positive response to liver extract therapy is not diagnostic of pernicious anemia. This again does not affect the opinion held by Minot[5] that the diagnosis of pernicious anemia should be looked upon with doubt in any case in which there is no favorable response to massive and prolonged treatment with potent liver extract. Thus, in some cases, the diagnosis of pernicious anemia at the present time seems so difficult that one is inclined in the last analysis to rely on the presence of a typical combined degeneration of the ascending and descending tracts of the spinal cord for a definite diagnosis. This statement is hardly modified, but rather supported by the well known existence of cases where the cord changes precede the anemia by several years or the anemia never develops. Somewhat at variance with this view is the standpoint taken by Naegeli[4] and Downey,[2] who feel convinced that certain characteristic changes in the arrangement of the lobules or the chromatin and in the granulation of the neutrophilic leukocytes occur with sufficient regularity to make the "pernicious anemia neutrophil" the most valuable single symptom for the diagnosis of pernicious anemia.

Viewing the question of the occurrence of pernicious anemia during infancy and childhood in this light, considerable difficulties arise. The following viewpoint might well be drawn into the consideration in this connection. The familial occurrence of pernicious anemia has been well established, possibly to a degree sufficient to suggest an hereditary factor. One might well expect this hereditary factor to be more marked, or at least sometimes present in cases reported as pernicious anemia in early life. This factor does not seem to have been taken into consideration in the reported cases of pernicious anemia in the young.

It is evident that some of the cases reported in the literature of fatally ending anemias in childhood presented a blood picture identical or closely resembling the blood picture in pernicious anemia. To this group belong the cases described by:

1. *Hotz.*[3]—The case of Anna K., aged 11, whose principal complaints were weakness, increasing pallor, anorexia, diarrhea, abdominal pain, occasional fever. She was well developed, well nourished, but did not have the characteristic lemon-yellow hue to the skin. She went progressively downhill until her hemoglobin was around 30 per cent and red blood cells 1,320,000. By the use of a diet and iron injections, she had a remission in which her blood apparently became normal. This condition lasted for six months; then, without any response to therapy, she went again downhill, developed bronchopneumonia, and died. No examination of the gastric juice was made, and no neurological findings suggestive of subacute combined degeneration were noted, but the blood presented a red cell picture which was described by the author as indistinguishable from pernicious anemia.

2. *Von Seth.*[6]—A fifteen year old boy, who complained of weakness, pallor, marked dyspnea,

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and slight general anasarca. For seven months his blood went up and down, but never reached normal, with anasarca increasing in amount. His red count was 650,000, hemoglobin 12 per cent, leukocytes 2,500. He died, and postmortem examination revealed red bone marrow, an enlarged spleen and liver with marked hemosiderosis, dilated heart with normal valves, and bilateral pleurisy.

3. *Andrew Barr.*[1]—A sixteen year old boy, who was well developed and well nourished. He complained of progressive weakness of three months duration with increasing pallor of the skin for five months, and, when admitted to the hospital, had a distinct lemon-yellow color of the skin. The subcutaneous fat was well preserved. Never on admission or throughout his illness was glossitis present. He had an achlorhydria, and he ran a slight fever. On admission his blood showed 770,000 red blood cells, 5,600 white blood cells and hemoglobin 22 per cent. Five weeks after admission his red blood cells were 420,000 with a hemoglobin of 10 per cent. Three months after admission he rallied and improved to the extent of 850,000 red bood cells and 23 per cent hemoglobin. This improvement did not continue more than twelve days when he took a sudden turn for the worse and died. No postmortem examination was done.

4. *Zuzki*[5] *of the Department of Pediatrics, University of Kyoto.*—A case in a nine year old child which was impossible to differentiate from a typical pernicious anemia. The clinical course of this case was progressively downhill to a fatal outcome. The red blood cells showed polychromasia, anisocytosis and poikilocytosis, and there were megaloblasts and normoblasts present in the blood smear. Although there was no remission in this case, the presence of normoblasts speaks against the diagnosis of aplastic anemia. This case is of particular interest in view of the fact that pernicious anemia is extremely rare, if at all present, in the Japanese and Chinese races. From the clinical course, it is doubtful whether this was a case of pernicious anemia, but from the morphological red cell picture, it would not be possible to differentiate from the true pernicious type of anemia.

It is worthy of notice that the clinical picture in these cases is incompletely recorded and that the course of the disease presents certain deviations from the ordinary picture of pernicious anemia. One only had a characteristic remission; one only had a characteristic lemon-yellow skin; achlorhydria was mentioned once. In but one of the cases is there any mention of a neurological examination. There is only one account of postmortem examination.

To sum up: There are certain cases in the young where the red blood cell picture is indicative of pernicious anemia, but where the clinical course is not characteristic. To decide about the name of this group of cases seems of less importance than clearly to recognize their existence.

In presenting the following two cases attempts have been made to give due consideration to the previous discussion. One patient is alive and making progress; the other is not alive, but autopsy was not obtained.

Case 1.—A young girl, aged 15, was first seen in consultation with Dr. Widen at the Norwegian Deaconess Hospital in Minneapolis.

Present Complaint: Weakness and general malaise of two years' duration; nausea and vomiting for six weeks.

Present Illness: Before the age of ten, she had smallpox and measles, both evidently rather mild. At eleven she started to menstruate, and has been regular ever since, even when her anemia was most profound. When thirteen years of age, she noticed that she tired easily and felt weak most of the time. That summer she was sent to a farm, where she improved to the extent that when the school year started in September, she was able to enter. About Christmas time her symptoms of weakness and general malaise gradually increased until Easter, 1928, when she fainted while walking to church. About this time a definite change in her complexion was noticed. This was described as very pale. In spite of the increase of her symptoms she continued her school work and finished the spring term. That summer, at the age of fourteen, she again went to the farm, but this time there was no improvement. In September she started school again, but at the end of one week she had to stop because of marked increase of general malaise, dizziness, nausea, vomiting and fever. She was put to bed. With rest in bed she improved to the extent that she was able to be up and around. This continued for about two months, and then she took a progressively downhill course with the above symptoms markedly increased. She entered the Norwegian Deaconess Hospital January 19, 1929. No definite diagnosis was made although tuberculosis was considered. After a week in the hospital it was necessary to start feeding her by rectum because of increased nausea and vomiting.

Family history cannot be obtained.

Physical Examination: January 31, 1929: A rather well developed, well nourished, young female, lying comfortably in bed, appearing much older than her actual age. Her hair is prematurely gray. There is a slight icterus of skin and conjunctiva. Eyes react nor-

mally to light and accommodation. Ophthalmoscopic examination shows a few old hemorrhagic spots in both retinæ. The discs are very pale, otherwise normal. The tongue is clean, smooth on the edges and atrophic, no soreness present. Tonsils have been removed. Teeth and gums are in good condition. Mucous membranes very pale. Neck shows nothing abnormal. The stage of nutrition is remarkably good considering the duration of the illness. The lungs are normal, presenting a slightly exaggerated type of vesicular breathing. The heart is normal in size and position. There is a systolic murmur heard at the apex. Blood pressure 112/90. The abdomen is normal except for the spleen, which is just palpable at the costal margin. Rectal examination reveals nothing abnormal from the pelvic organs. The temperature while in the hospital varied from 36.6° to 39.8° centigrade.

Neurological Examination: Reflexes are all sluggish. The position sense of the big toe is questionable. Babinski is negative. The patient states that her toes are numb, but objective examination is negative.

Summary of Laboratory Examinations: Blood (January 31, 1929)—Hemoglobin 15 per cent (Sahli), red blood cells 800,000, white blood cells 2,000. Blood smear showed numerous pernicious anemia neutrophils with many myelocytes and premyelocytes, occasional myeloblasts, normoblasts, and megaloblasts, young and atypical monocytes and many degenerating small lymphocytes. The detailed blood study by Professor Hal Downey is as follows:

2/5/29—On this date the blood picture was the most typical of pernicious anemia. Pernicious anemia neutrophils very numerous, but there are not many of the "toxic" type. Myelocytes and premyelocytes very numerous, and there is an occasional myeloblast. Normoblasts and megaloblasts. Young and atypical monocytes and many degenerating small lymphocytes.

2/7/29—Slight polychromatophilia of reds. Normoblasts, but no megaloblasts. Premyelocytes, myelocytes and metamyelocytes are very numerous. Toxic and pernicious anemia type of neutrophil. Young and atypical monocytes.

2/13/29—Marked polychromatophilia. Some myelocytes and metamyelocytes. A few normoblasts. Not very many pernicious anemia neutrophils. Some polymorphonuclears of toxic type.

2/21/29—Last date when smears were made. Anisocytosis, macrocytes and microcytes. No polychromatophilia. No nucleated reds. No myelocytes and only a few typical pernicious anemia neutrophils. There are still a few atypical monocytes and an occasional degenerating small lymphocyte.

In all the above examinations the blood smear showed all stages of hyperchromasia and anisocytosis of reds.

Blood Wassermann negative. Widal negative. Agglutination test for bacillus melitensis negative. Blood urea nitrogen 14 mg. per 100 c.c. blood. Blood sugar 122 mg. per 100 c.c. blood. Icterus index 12, falling to 4 as the patient improved. Gastric secretion after .5 mg. histamine shows a total chloride concentration of 182 mg. per cent, but no free hydrochloric acid and a total acidity of 8. Stool examination revealed nothing abnormal. Urine: Specific gravity varied from 1.014 to 1.022, acid, negative for albumin and sugar. Microscopic examination showed occasional epithelial cells, otherwise negative.

Diagnosis: Pernicious anemia.

Treatment: Because of the patient's critical condition, a blood transfusion was considered, but deferred since previous experience with other cases had given us the impression that the effect of liver therapy is less marked after blood transfusion. The patient was grouped and donor arranged for so that, if necessary, a transfusion could be given without delay. Although the patient was nauseated and vomited, she was given 32 capsules of Stearn's liver extract the first day. She vomited the second dose, but it was repeated. The following day she was given 29 capsules, and she was able to retain them all. She was given 30 capsules daily for the next eleven days, 25 capsules daily for the next six days, 15 capsules daily for the next seven days, then 10 capsules daily for the remaining days in the hospital and was discharged on 6 capsules daily. Seven of Stearn's capsules corresponded to 112 grams of liver. The patient was also given dilute hydrochloric acid with her meals. This was not started at once, but when it was started the patient noted a marked improvement in her appetite. She was given a high vitamin, high caloric diet.

Clinical Course: At first it was hard for the patient to take the capsules, but as the doses she vomited were repeated she soon stopped vomiting. At the end of the third day there was a marked clinical improvement as well as a laboratory response in the form of a reticulocyte increase (Chart 1). After one week there was a definite increase in both the red blood cells and in the hemoglobin and a marked response in the reticulocytes. The patient could start to use a back rest one week after liver therapy was instituted. At the end of three weeks she was up in a wheel chair, taking a few steps at the end of twenty-eight days. She was discharged February 28, 1929, with a hemoglobin of 68 per cent and 3,750,000 red blood cells and was able to walk out of the hospital. She has, up to September, 1929, gained 40 pounds in weight and her face is ruddy and it is not necessary for her to use rouge. In spite of this it has not been possible to bring her hemoglobin above 71 per cent nor her red blood cells above 4,200,000. Up to this time she has received raw liver, Lilly's Liver Extract No. 343, cod-liver oil and iron, and bone marrow and iron, without any further increase in her hemoglobin.

On May 15, 1929, the patient returned to the clinic, complaining of numbness of her feet. As she walks in her home she has a tendency to stumble over the rugs. A complete neurological examination at that time failed to reveal any objective signs of a cord lesion.

The patient was admitted to the University Hospital November 15, 1929, with a hemoglobin value of 22 per cent and a red blood cell count of 1,100,000. The patient during the last two months has admittedly been

careless about keeping up her diet. She has been taking only 4 capsules of Stearn's Liver Extract two or three times a week. From September, 1929, to November 11, 1929, the patient was not under our observation. She states that soon after she began neglecting her diet her weakness and diarrhea gradually returned until the last week in October it was necessary for her to go to bed. She entered the University Hospital with

Case 2.—A. N., a white female aged 18, was admitted to the University Hospital July 9, 1925, and discharged October 28, 1925.

During childhood the patient enjoyed good health. She had no infectious disease except measles at six years of age and was not sick again until April, 1925, when she ate some canned beef. She was in bed at that time for a few days. About the first of May she

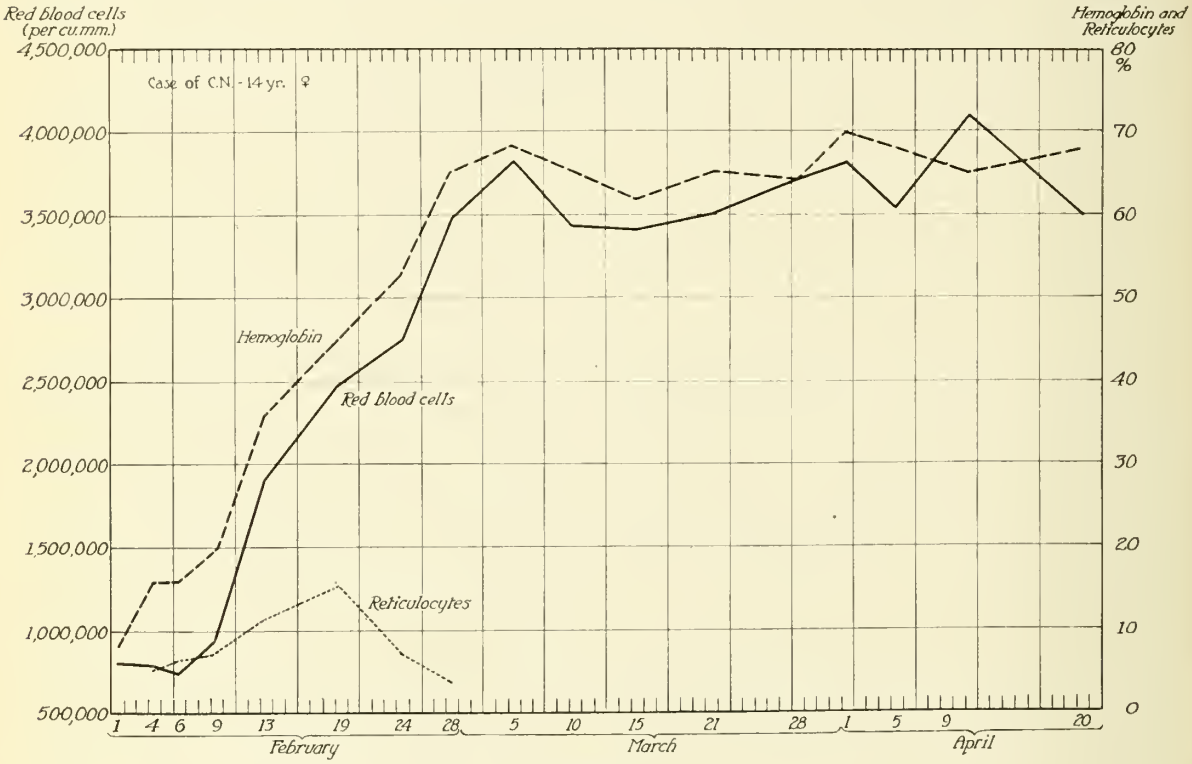


Chart 1

chills and fever caused by an acute sinusitis. The white cell response to this infection was very marked. There was a marked shift to the left with myeloblasts, leukoblasts, promyelocytes and myelocytes. The total white count at the height of her infection was 9,950. Fourteen days later the blood showed a remarkable improvement to the extent that only an occasional myelocyte and pernicious anemia neutrophil was present. There was still anisocytosis and poikilocytosis present. While in the hospital she was given large doses of Lilly's Liver Extract and at the end of three weeks we were able to discharge her with a hemoglobin of 60 per cent and a red blood count of 3,100,000, and she was to receive 6 vials of Lilly's Liver Extract daily for the first week after discharge, and 4 vials daily thereafter. The patient made a remarkable clinical improvement on this short stay in the hospital. The objective neurologic examination on this admission was still negative.*

*Recently this patient has been given linseed oil, 2 tsp. T.I.D., and her liver dosage reduced to 2 vials of Lilly's daily. On this régime the hemoglobin increased to 72% and the red count reached 5,380,000.

noticed that she became fatigued very easily and that she would get more dyspneic when walking fast. It was difficult to keep her hands and feet warm. This continued until one week before entrance into the hospital, when she noticed numbness and tingling in her fingers and toes. She found it necessary to spend most of her spare time resting. About the tenth of May her friends began to tell her that she was getting very pale, but she continued her high school work until May 18, when she stopped because of weakness and went to bed. She stayed in bed until June 8, when she was able to be up and around, but did not have the strength to carry on her usual work. During this illness there were times when her tongue was sore and occasionally she had attacks of epistaxis. Her menstrual history was essentially negative. The family history was negative except for the death of one brother at the age of nine from brain fever.

Physical Examination: Girl, very anemic in appearance, lying quietly in bed apparently in no discomfort. She appears much older than her actual age. She is well developed and well nourished; weight 48 kg. Skin shows a slight icterus. The face appears some-

what swollen, but there is no pitting on pressure. Pupils normal, sclera is bluish-white, conjunctivæ very pale. Mucous membrane of the mouth very pale. Teeth in good condition. Tongue shows an atrophy more noticeable on the borders of the tongue. Tonsils and pharynx show no abnormality. Neck within normal limits. Chest—patient complains of nightly pain over the sternum. This at times is exaggerated by palpation. Lungs show no abnormalities. Heart normal except for a soft systolic murmur at the apex and an accentuation of the second pulmonic sound. Blood pressure 110/50. Abdomen—spleen palpable under the costal margin; otherwise no abnormal findings.

Neurological Examination: The patient gave a typical history of paresthesia of hands and feet, but the Neurological Service was unable to demonstrate any signs of combined degeneration.

Laboratory Examination: Temperature varied from 37° to 38.5° centigrade, and pulse from 80 to 120. Blood examination on admission—20 per cent hemoglobin, 1,080,000 red blood cells, 4,300 leukocytes. Differential count—24 per cent polymorphonuclears, 70 per cent lymphocytes, 4 per cent large monocytes and 2 per cent eosinophils. Detailed blood study by Professor Downey showed numerous pernicious anemia neutrophils with megaloblasts and normoblasts with marked macrocytosis and some poikilocytosis. The blood did not improve morphologically while in the hospital, but there was some improvement up to 35 per cent hemoglobin and 1,520,000 red blood cells. The direct van den Bergh test was negative; the indirect positive and quantitated to 35 units. Examination of the gastric function (Ewald meal) showed an achlorhydria. Wassermann was negative. Blood chemistry normal. Basal metabolic rate within normal limits. Fragility test—hemolysis began at .38 per cent sodium chloride and was complete at .34 per cent. Numerous examinations of the feces revealed nothing abnormal. Parasites or ova were not found. Repeated urine examinations did not reveal any presence of albumin or sugar.

DISCUSSION

Two cases of what might well be diagnosed as pernicious anemia in two girls aged 15 and 18 years have been reported. In the first case the blood morphology was studied in considerable detail by Dr. Madeleine Fallon of this department. Both cases were studied by Professor Hal Downey, particularly the younger and more recent case. The appearance and reaction of the red cells were fully characteristic in both cases. The "pernicious anemia neutrophils" so highly valued as a diagnosticum by the morphologists, but accepted with a certain hesitancy by the clinician, were present in both cases. The reaction of the neutrophils towards immaturity was of special interest in the younger patient. Though it has long been recognized that particularly during a blood crisis immature neutrophils as far back as myeloblasts appear in the circulation in pernicious anemia, this reaction was unusually dominant during the acute septic infection which prevailed at the second admission of the younger patient. This extensive release of immature forms appears as a rather characteristic bone marrow response in the young.

Clinically striking features in the younger patient are not only her early gray hair, but also her generally early development with a body frame and a development of fat on breasts and hips which usually is not present until fifteen to twenty-five years later.

Achlorhydria was present in both patients.

Subjective neurological symptoms were recorded in both patients, but in both objective neurological signs were missing.

In the older patient no remission ever occurred. In the younger patient one might possibly talk about a remission two summers before the patient came under medical observation. Without liver therapy the end would not have been far off when the patient was first seen. Also it deserves notice that the last relapse came on soon after the first hospitalization and developed rapidly.

It is a point of regret that information as to heredity could not be obtained in either case.

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CONGENITAL SYPHILIS*

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TO the laity, congenital syphilis presents a gruesome picture of horrible deformities, of innocent, unfortunate, yet loathsome things; to the medical profession it presents just another problem in diagnosis and treatment. But truly those afflicted are victims of circumstance, whose chances for normal lives are too often viewed with unpardonable pessimism, never with undue optimism. Congenital syphilis presents itself as a problem to society as a whole, but more particularly and more definitely to the obstetrician, the pediatrician, the internist, the syphilologist and the general practitioner, not to mention the specialist in eye, ear, nose and throat. In brief, upon all of them depend the ultimate decline in the incidence of the disease and the satisfactory treatment and relief of those afflicted with it.

There is ample evidence in the literature to prove that the incidence of congenital syphilis is great enough to insure it an important place, indeed, among the medical problems of today. Minimum figures given by Stokes place the incidence of syphilis in the child population as a whole as ranging from 3 to 5 per cent.[5] Jeans and Veeder of St. Louis in their own hospital material found 2 per cent among 5,185 new patients—with an incidence of 4.9 per cent in those under one year—latent cases not included.[4] The Wassermann has shown that many cases without any clinical evidence of syphilis have a latent infection, Wirz having shown that as high as 3 per cent of apparently non-syphilitic babies have a positive Wassermann reaction. Quoting Jeans and Veeder: "It is useless to estimate the number of syphilitic children. We know that there are many more than we estimated a few years ago."

My purpose within the scope of this short paper is to present a series of cases as observed and treated at St. Mary's Hospital, over a period of ten years, and to compare such a study with those reported by some of the larger clinics; but before doing that I should like to summarize briefly some rather interesting points from the literature. 1. The prognosis in congenital syphilis is generally good as evidenced by statements by leading pediatricians and syphilologists of the country. From Jeans and Veeder comes the encouraging statement: "As well as can be judged in the period since the use of the newer remedies and the more recent method of application, infants who are well treated do not later have any manifestations whatever of syphilis and enjoy as good health as though they never had the disease."

2. The best treatment of the infection is prophylactic, which brings us to the great responsibility which rests upon every doctor who cares for the expectant mother. Out of 1,332 pregnancies in 250 syphilitic families reported in the literature, 22.7 per cent ended in miscarriages and stillbirths, 20.8 per cent in infant deaths, 58 per cent in living syphilitic children and 18.3 per cent living healthy children; among 1,366 living births in syphilitic families 30 per cent died in infancy.[4] In all, it represents a tremendous toll upon human life—especially significant when it is stated that antiluetic treatment of the mother during her pregnancy will result in non-syphilitic offspring—though this treatment is not by any means sufficient to produce a cure.

3. No matter how late the expectant mother comes to the doctor, it is worth while treating her even though the fetus is already infected. The treatment should not be too intensive and should be governed by the period of gestation and stage of the infection. It should be modern treatment and should include the use of the arsphenamines particularly, with bismuth and mercury as valuable adjuncts. Stokes' outline of treatment in Modern Clinical Syphilology is perhaps the best available for reference and should be consulted.

4. Careful histories and routine use of the Wassermann will save many mistakes and go a long way in the battle against congenital syphilis.

5. It is generally conceded by most authorities that infection of the child takes place through the maternal blood stream and placenta —and that the treponema can be recovered from the same.

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6. The child is probably infected after the third month in most cases, though it may be infected at any time during intrauterine period. The date of the infection, its virulence and extent of the mother's defense mechanism may determine whether the infection after birth will be a far advanced, infantile or tardive form.

There are, briefly, three types of congenital syphilis: (1) fetal and syphilis of the newborn; (2) infantile or early congenital syphilis; (3). late or tardive congenital syphilis.

The first type is the one which results in death in the embryonal stage, in the fetal stage, at birth, or shortly after—a few hours to a day or two. The diagnosis is made on the appearance of the placenta but best upon the basis of finding the spirochetes in the organs of the fetus. Pathologic examination of the placenta and study of the fetus by a pathologist is recommended in every case, along with family investigation and maternal and fetal Wassermanns. Careful investigations and study will lead to the diagnosis and treatment of the mother and the protection of all subsequent pregnancies. Therefore, it is, from the standpoint of preventive medicine, the most important type to recognize.

The second type, or infantile congenital syphilis, represents a very interesting but frequently very discouraging picture of the infection. The blood Wassermann, which is negative in 37 per cent, weakly positive in 18 per cent, and strongly positive in only 45 per cent, according to Stokes, cannot be relied upon absolutely for the diagnosis. Certain authors do maintain, however, that all syphilitic infants have strongly positive Wassermanns after the first few weeks or months of life. In the small series of ten cases observed here, 80 per cent were strongly positive. The stigmata were fairly marked in 80 per cent of the cases and entirely absent in 20 per cent; but in the latter the Wassermann reaction was positive. The following table taken from Stokes[5] summarizes fairly well the chief symptoms to be kept in mind at all times when observing the infant:

SUMMARY OF CHIEF SYMPTOMS OF INFANTILE CONGENITAL SYPHILIS

Eruption—Rare before third week, distribution distinctively to face and mouth region, the anogenital region, and palms and soles; macular, maculopapular, secondarily eczematous and often infected. Condylomas and mucous lesions. Pemphigoid bullæ, 10 per cent.

Snuffles—As common as eruption and as early. May be mild and not distinctive; almost diagnostic if hemorrhagic.

Hacking of Lips—Fissures, especially of the upper lip and middle of the lower.

Rhagades—Infiltrative, fissures, eczematous involvement of cheeks, and chin near the commissures.

Enlarged Spleen—Almost diagnostic before the fourth month.

The Cry—Cracked and aphonic. Very suggestive.

Pseudoparalysis—Flaccid of upper extremity, spastic of lower, presumably due to painful movement, but may be neuritic; due to osteochondritis and epiphysitis.

Osteochondritis, Chondro-epiphysitis, and osteomyelitis—Palpable enlargement and tenderness of ends of long bones, single or multiple; most often there may be a fusiform involvement of shaft of the bones in the upper extremities.

Saddle Deformity of Nose—The sequel of the osteitis and gummatous changes in snuffles.

Pulmonary, Hepatic, Marasmic Symptoms—Less common.

The series in the venereal clinic here is so small that any conclusions are unreliable, but I have included in the next table the admittance signs and symptoms as they were casually observed. More detailed examinations at the time, in all probability, would have revealed many more.

10 Cases of Infantile or Early Congenital Syphilis

1. Snuffles, 6.
2. Hydrocephalus, 2.
3. Hacking of Lips, 1.
4. Paronychia, 1.
5. Osteochondritis, 1.
6. Rhagades, 1.
7. Papular Lesions (Syphilides), 2.
8. Chancre on Tongue, 1.
9. No stigmata at all, 2.
10. Positive Blood Wassermann (first), 8.

The third type, the late or tardive syphilis, comprises the majority of the cases of congenital syphilis seen in this clinic, and is the most interesting of all congenital syphilis because of the diversity of its manifold signs and symptoms.

Again, because of lack of time, I am confining myself to a summary and comparative study of the incidence of these signs and symptoms in our series and that of Jeans and Veeder of St. Louis, with a comparison also of the most common signs and symptoms in a series of 202 cases reported by Stokes. I am sure that more of the conditions listed by this author would have been covered in the cases here if a careful study had been made with aid of the *x*-ray and spinal fluid analysis.

The reader will note the striking incidence of the eye lesions, particularly the interstitial keratitis, which in turn indicates the important part

Comparative study of signs and symptoms in late syphilis—% incidence.	100 Consecutive St Louis Admissions at Children's Hospital	50 Cases Reporting to Venereal Disease Clinic at St. Mary's Hospital, Duluth	202 Cases Reported by Stokes
1. Bones			
a. Periostitis Tibia	4	4	43
b. Periostitis Skull	1	....	....
c. Osteomyelitis	1	....	....
2. Joints			
a. Acute arthritis knee	8	....	2
b. Acute arthritis ankle	1	....	....
c. Acute arthritis elbow	1	....	....
d. Chronic synovitis knee	1	2	....
3. Skin			
a. Gummata	3	2	6
b. Alopecia	3	....	....
4. Eye			
a. Interstitial Keratitis	25	50	52
b. Choroiditis	1	....	8
5. Ear			
a. Deafness	1	2	10
6. Ulcerations			
a. Nasal	2	6	30
b. Laryngeal	1	....	....
c. Pharyngeal	1	....	....
7. Central Nervous System			
a. Cerebrospinal syphilia	14	14	26
b. Hemiplegia	6	2	....
c. Epilepsy	5	....	....
d. Spastic paraplegia	4	4	....
e. Old Hydrocephalus	2	2	....
f. Optic Atrophy	1	....	....
g. Mental deficiency	16	22	25
8. Miscellaneous Conditions			
a. Ozena	1	....	....
b. Enlarged spleen (only sym.)	1	....	....
c. Enlarged epitrochlears (only sym.)	1	....	....
d. Obscure abd. pain	1	....	....
e. Obscure muscular pain	1	....	....
f. Obscure pain in legs	2	2	....
g. Endarteritis obliterans	1	....	....
h. Paroxys. hemoglobinuria	1	....	....
i. Raynaud's Disease	1	....	....
j. Hutchinson teeth	4	14	30
k. Enamel defects of teeth	2	6	....
l. No teeth at all	....	6	....
m. No stigmata	....	8	....
9. Serologically			
Pos. W. R. (First)	....	66	66

which the doctor plays who specializes in eye, ear, nose and throat. In this connection it might be mentioned that the anti-syphilitic treatment in the presence of an interstitial keratitis should always be done with the coöperation of an ophthalmologist if possible. I was interested to note in an account by Ehlers[3] on the fight against congenital syphilis in Scandinavian countries that the incidence of interstitial keratitis was given as 60 per cent; and that the complete Hutchinson triad was observed in only two cases during the author's sixteen years of observation.

Now we pass over to consider for a moment the treatment employed in congenital syphilis; and summarizing the treatment, including that employed by Stokes, Jeans, and Veeder, and of Dickey and Sutton of California, the following conclusions may be drawn:

1. The arsphenamines, either arsphenamine or neoarsphenamine, are to be preferred. They are best given intravenously when that method of administration is practicable.

   (a). The dose of arsphenamine employed is .025 at two weeks to 0.1 gm. from six weeks to two months. The dosage in older children is based on the child adult ratio, according to the case. (Jeans employed .01 gm. per Kg. body weight.)

   (b). Neoarsphenamine, which may be used intramuscularly, is given in doses of 0.2-0.3 gm. by Stokes in the one to two year period. (Jeans used .015 gm. per Kg. body weight.)

   (c). Sulpharsphenamine is used by Sutton and Dickey because it can be given intramuscularly without irritation. Dose .015 gm. per Kg. body—increasing to .03 during first eight injections.

In the clinic here the sulpharsephenamine was used intramuscularly in doses of .015 to .03 gm. per Kg. body weight, until the child became old enough to make intravenous therapy practicable. Then neoarsphenamine in amounts bordering on adult doses .1 to .4 gm. was used in practically all cases.

Intravenous administration was conveniently employed at four years in a number of cases coming in at that age. Neoarsphenamine was not used intramuscularly because of the marked irritation which results in many cases.

2. Bismuth in the form of bismuth phenylformitate in doses of 15 mg. per Kg. body weight is used in preference to mercury by Sutton and Dickey.[2] Bismuth in form of Bismogenol is preferred over mercury also by Dr. H. E. Michelson at the University of Minnesota.[6] Bronson at the New Haven Dispensary used potassium bismuth tartrate in dose of 0.1 gm. regardless of age.[1] This author, in a series of thirty-one cases treated, stresses the value of bismuth in children because: (1) it is well tolerated; (2) it can be used effectively in those cases intolerant to arsenic; (3) it proved particularly favorable in the cases of interstitial keratitis and syphilis of the central nervous system, treated.

The experience of the St. Mary's Hospital clinic with both bismuth potassium tartrate and the salicylate in dosage of 0.1 gm. has been very satisfactory.

3. Mercury in the form of the bichloride in doses of approximately 5 mg. per Kg. body weight for infants (Sutton and Dickey) or .03 c.c. of a 1 per cent solution per kilo. of body weight (Jeans), is used by a number of writers. Mercury rubs, in the form of the official Unguentum Hydrargyri .05 gm., is still advocated, but particularly in infants. Stokes uses the rubs in doses of 1 gm. in young infants to 4 gms. in older children once daily. Jeans likes to use metallic mercury in finely divided chalk in dosage of 1/5 gr. t.i.d. for young infants to 2 gr. or more t.i.d. for larger children; but most of the other writers do not. Mercury succinimide in doses of 1/20-1/4 gr. is used more than any other form in this clinic and seems particularly well tolerated, convenient and effective in the younger children.

4. Potassium iodide in doses of 3-7.5 grains t.i.d. by mouth is advocated in cases of painful periostitis, but is not advised routinely.

5. The basic routine was alike in most respects, and provided for weekly injections of one of the arsphenamines for six to eight doses in a series, a short rest with or without mercury rubs at home, and ten to twelve injections of bismuth or mercury to a series. Intensive, persistent treatment, bordering on adult ratios, was the tendency here, at the University, and with Stokes.

The extent of the treatment is variable; but practically all agree that thorough treatment is byword in congenital syphilis. If active signs of

the infection are present intensive treatment is indicated until such signs disappear and the Wassermann reaction is negative (if latter is possible) At best this will probably mean two years, and frequently longer in the late cases. After this the patient should receive at least moderate treatment over as long a period as possible. By moderate one should include a minimum of two courses a year of bismuth or bismuth and mercury alternately with an occasional series of neoarsphenamine. Dr. H. E. Michelson believes that a congenital luetic should be treated for at least five years and kept under careful observation as long as possible. The policy in our clinic has been to give intensive persistent treatment as long as possible, with the clinical results used largely as the criterion, and the Wassermann reversal as a desirable end-result. Whenever possible, the cases are followed through puberty, the treatment being increased rather than decreased throughout adolescence.

Spinal fluid analysis is advocated by Jeans if no results are obtained from the treatment in six months to a year. Intraspinal therapy (technic similar to Swift-Ellis) may be used in selected cases of cerebrospinal syphilis.

The final basis for discharge in most clinics is a negative spinal fluid and a careful neurological examination. Spinal fluid analysis has not been required in most of the cases in our clinic because they are carried through to maturity under treatment anyway.

In discussing the results obtained generally in the treatment of congenital syphilis, one must admit that they in the main are encouraging. Stokes reports results more favorable than most others, in the following: 82 per cent of 170 cases achieved a good clinical result and 62 per cent a serologic reversal to negative. White and Veeder of St. Louis after evaluating their results over a period of many years give the following: from a total of 208 cases 22 per cent cured or recovered, 35 per cent improved, 17 per cent unimproved and 25 per cent died. In Denmark, where the congenital syphilitic children are received in special asylums, Ehlers reports the ultimate fate of the first hundred children discharged, as follows: 22 per cent died, 37 per cent developed like normal individuals, 28 per cent were backward and showed retarded development and 13 per cent became imbeciles. The mortality in these reports is not given in age groups, but it is probably true that a large percentage are the early fulminating cases where infections of the lung play an important part.

Our results here have been highly satisfactory from a clinical standpoint; much less so from a serological standpoint. In the series of sixty cases, a reversal of the Wassermann was obtained in only 20 per cent; but out of twenty negative on admittance, nineteen remained so under intensive treatment, which leaves a total of 50 per cent persistently positive. Some of these cases have been under treatment but a short time and more reversals may be expected in time. In twelve of the cases of persistently positive Wassermann reaction, bismuth has been used extensively over a number of years along with the neoarsphenamine in hope of reversing the test, without results. Two of our cases died, one of tuberculous meningitis and the other was suspected of having tuberculosis but no postmortem was obtain to verify this. Four of the sixty-one cases were just recently placed under treatment and eight were either transferred to private doctors, or left the city—leaving forty-seven. Of this number all but four have achieved a good clinical result. Twelve cases have to date been carried through puberty, are apparently cured, and show no evidence whatever of having ever been afflicted with congenital syphilis. In a personal communication with Dr. H. E. Michelson, I was able to learn that in his experience with congenital syphilis the clinical results have been very satisfactory in the main; and the serological much less so.

As 50 per cent of our cases here have been under treatment for four years or longer and some as long as ten years, I have endeavored to bring before you, as evidence of our success, as many cases as possible. These are not picked cases; in fact several of our best are holding good positions in the city and were afraid to come here despite the assurance that only the illustrious staff of St. Mary's would be present:

Case 1.—L. W. is a female baby now one year of age who was brought to the clinic at two months of age with florid rickets, large head, marked snuffles, fissures of hands, feet and mouth; and was then scrawny and appeared quite toxic. The Wassermann reaction was Kolmer positive. Because of the marked activity of the syphilis, the baby was given twenty mercury rubs followed by a rest of three months. Since then it has been on sulpharsphenamine intramuscularly. As you see it now the snuffles have completely cleared up, there

has been a marked gain in weight and sufficient body development to offset the previously large head. Its teeth are erupting normally and the rickets is apparently controlled.

Case 2.—F. S. is a twelve year old girl, who was admitted to the clinic without previous treatment one year ago with a marked bilateral interstitial keratitis. She was markedly underdeveloped and undernourished; but apparently was not retarded mentally. There was considerable scarring from previous fissures about the nose, mouth, anus and vagina. The Wassermann was Kolmer positive. Her treatment has consisted of mercury succinimide largely, with neoarsphenamine intravenously. As you see her now there has been a marked gain in weight and some developmental improvement. The keratitis has receded and the child seems quite well. We hope to prevent a recurrence and will give the patient the benefit of continued treatment, including bismuth.

Case 3.—B. K., a female, aged 5, was admitted to the clinic at the age of 3 months with marked snuffles, hydrocephalus, and in a state of undernourishment. The Wassermann reaction was Kolmer positive, and has remained persistently positive in spite of the following treatment:

Course 1.—24 mercury succinimide (.05-.10 gr.)—1 month rest.
Course 2.— 6 neoarsphenamine and 24 mercury succinimide—1 month rest.
Course 3.— 6 sulpharsphenamine and 24 mercury succinimide—1 month rest.
Course 4.—12 sulpharsphenamine and 24 mercury succinimide—1 month rest.
Course 5.—12 sulpharsphenamine and 15 bismuth potassium tartrate (.1 gm.).

As you see her now, the large head is not noticeable because the body development has literally "caught up" to the head. The child walked and talked at the normal age; her teeth developed and she seems quite bright mentally.

Case 4.—O. C., a young woman nineteen years of age, was admitted to the clinic five years ago because she had definite Hutchinson teeth, and was thin, underdeveloped and anemic. The Wassermann was Kolmer positive. The patient had not had any previous treatment. Her progress in school was not good though she was not subnormal. The treatment was instituted as follows:

Course 1.— 6 neoarsphenamine (.3 gm.), 24 mercury succinimide (.1 gr.)—3 mo. rest.
Course 2.— 6 neoarsphenamine (.4 Gm.), 24 mercury succinimide (.2 gr.)—1 mo. rest.
Course 3.— 6 neoarsphenamine (.4 gm.), 24 mercury succinimide (.2 gr.)—1 mo. rest.
Course 4.— 6 neoarsphenamine, 15 bismuth potassium tartrate—2 mo. rest.
Course 5.— 9 neoarsphenamine, 24 mercury succinimide—2 mo. rest.
Course 6.—15 bismuth—4 mo. rest.
Course 7.— 6 neoarsphenamine, 15 bismuth.

The Wassermann has remained persistently positive. There is nothing to indicate now as you look at this —you will admit—very good looking young lady, that she ever had been afflicted. She has developed perfectly through puberty, seems bright and quite normal in every respect.

Case 5.—B. C. is a sister of the patient just observed, is now twenty-one years of age, and was referred by a private physician five years ago. She had been under the care of a doctor three years before for poor vision, but received no anti-syphilitic treatment. She was placed in the sight-saving class at school. At the time she appeared at the clinic she was markedly undernourished and underdeveloped. Her vision was 20/200 in both eyes due to interstitial keratitis of a chronic type. The Wassermann reaction was Kolmer negative on admission, became positive after the second course of treatment and has been negative repeatedly since. Treatment was started immediately as follows:

Course 1.— 6 neoarsphenamine and 24 mercury succinimide (.2 gr.)—1½ mo. rest.
Course 2.—15 bismuth—1 mo. rest.
Course 3.— 9 neoarphenamine and 24 mercury succinimide—2 mo. rest.
Course 4.— 6 neoarsphenamine and 15 bismuth—2 mo. rest.
Course 5.—15 bismuth—3 mo. rest.
Course 6.— 9 neoarsphenamine and 24 mercury succinimide—2 mo. rest.
Course 7.—15 bismuth—3 mo. rest.
Course 8.—15 bismuth—2 mo. rest.
Course 9.—15 bismuth and 15 neoarsphenamine.

The patient consented to come tonight and again you see no evidence of any previous trouble. She is well developed, very well nourished and her sight is uniformly good, according to the eye specialist's report. She has married and with her now is her perfectly normal baby.

Case 6.—The next two cases are brothers. The first, twelve and one-half years old, came to the clinic at five and one-half years of age, poorly developed, undernourished, and very backward (was reported as feebleminded at the time). The lens in one eye was loose. The Wassermann reaction was Kolmer negative and has remained so since. His treatment has consisted of four courses of twelve neoarsphenamine and fifteen bismuth injections. Rest periods much longer than usual were given in this case.

His physical condition is excellent as you see; but he is still very retarded mentally.

Case 7.—This is a younger brother of the preceding case, now ten years of age, who was admitted to the clinic six years ago, very small for his age, thin, scrawny, and anemic. His Wassermann reaction was Kolmer negative and has remained so. The child was retarded mentally and had begun to walk and talk very late. He was placed on rather intensive treatment as follows:

Course 1.— 6 neoarsphenamine—2 mo. rest.
Course 2.— 9 neoarsphenamine and 34 mercury succinimide—18 mo. rest.
Course 3.— 9 neoarsphenamine and 34 mercury succinimide—5 mo. rest.

Course 4.— 6 neoarsphenamine and 24 mercury succinimide—6 mo. rest.
Course 5.— 9 bismuth—5 mo. rest.
Course 6.—12 neoarsphenamines and 9 mercury succinimide—6 mo. rest.
Course 7.—12 neoarsphenamines and 15 bismuth.

This boy has developed quite well but not nearly as well as his older brother; yet he is much ahead of him mentally for he is considered very bright in school.

Case 8.—H. M. is a boy, aged 11, admitted to the clinic four years ago with a history of being backward in school. The parents were syphilitic; but the child's Wassermann was Kolmer negative and has never been positive. No previous treatment had been given and the child was markedly underweight and underdeveloped.

The first course of treatment consisted of twenty-four mercury succinimide and six neoarsphenamine injections. Since that he has received four courses, six neosalvarsan and 15 bismuth in each. At present he is getting along very well in school, and is in very good physical condition.

Case 9.—A. M. is the sister of the above case and is ten years old and had been under treatment two years. At the time of her admission she had Hutchinson teeth, was underdeveloped and undernourished, and anemic. The Wassermann reaction was Kolmer negative repeatedly. Her treatment has consisted of four courses of six neoarsphenamine and 12 to 15 bismuth injections each.

Her present state is very much improved physically. Note her teeth, which are in good condition though the Hutchinson characteristics still remain.

Case 10.—H. F. is a boy aged 9, who has a very interesting history. He was seen by a doctor eleven months after birth. At that time he had an enlarged head, rhagades, snuffles, badly decayed teeth, markedly enlarged liver and spleen, discharging ears, and scars on the buttocks. The Wassermann reaction was Kolmer positive. The baby had been given some mercury rubs by some doctor before this (amount not known). Treatment at that time consisted of eleven injections of $HgCl_2$ (3 mg.) and mercury rubs at home. He was also given two small neoarsphenamine injections (.1 and .15).

This patient was not seen again until he was seven years old, at which time he had a paralysis of the entire right side of the body, the right eye being turned inward markedly. The Wassermann taken at that time was positive. He was given protiodide of mercury for a while without any change and was apparently lost track of.

He was brought to the clinic a short while ago when it was noted that he limped markedly on walking and was unable to hold a lead pencil in his hand. The eye was still turned in somewhat. Since then he has received nine injections of neoarsphenamine and eight mercury succinimide. The child's arm has improved and he is able to hold objects without any trouble. As evidence let this little fellow grip your hand.

Case 11.—R. L. is a boy about five and a half years old, who was brought to the clinic when four months old with snuffles, fissures, rickets and a weak, wailing cry. He was undernourished and very apathetic. The Wassermann was Kolmer positive. His treatment was as follows:

Course 1.—20 mercury succinimide (.05 gm.), 6 neoarsphenamine (.1 Gm.)—1 mo. rest.
Course 2.—12 sulpharsphenamine (.2 gm.)—2 mo. rest.
Course 3.— 9 sulpharsphenamine and 20 mercury succinimide—5 mo. rest.
Course 4.—20 bismuth—3 mo. rest.
Course 5.—15 bismuth—3 mo. rest.

There was marked improvement in his condition; he talked and walked normally. He has not received any treatment for a year because of his exceptionally good physical and mental condition and the repeatedly negative Wassermann.

Case 12.—F. B. is a very interesting case because it represents one of those unfortunate cases of late congenital syphilis. This young man, now eighteen years old, came under the clinic's care three years ago, at which time he was bedridden and in terrible shape. He was actually an emaciated, haggard dwarf, with a perforated palate and septum and extensive necrosis of the nasal bones. Instead of talking he had to whisper. His mental retardation was marked. Just when the stigmata first appeared is not known exactly; but we have snapshots of the patient as a baby and at about thirteen years of age (pictures passed around). In both he appears perfectly normal; and at thirteen years he was apparently a larger fellow than he is now.

The Wassermann reaction was Kolmer positive, became negative after the fourth course of treatment and has remained so. His treatment was as follows:

Course 1.—24 mercury succinimide and 12 neoarsphenamine—1½ mo. rest.
Course 2.—15 bismuth K. tartrate and 9 neoarsphenamine—2 mo. rest.
Course 3.—15 bismuth K. tartrate and neoarsphenamine—1½ mo. rest.
Course 4.—15 bismuth tartrate and 6 neoarsphenamine —4 mo. rest.
Course 5.—12 neoarsphenamine. Put on rest with potassium iodide.

Before the first course was completed the patient was able to get out of bed and was brought to the hospital for operation on his nose. As treatment was continued he began to get about on crutches, gained weight and was able to talk at least, though with a gruff, cracked voice. For the past year he has been able to run around, and has taken over the burden of supporting the family by starting a chicken farm. We feel particularly proud of this case because it represents the return of an invalid, a public charge, to a useful, responsible place in society. Unfortunately, this fellow is going to carry these stigmata through life; and a Wassermann in childhood would have saved this.

CONCLUSIONS

1. Congenital syphilis is more prevalent than is generally believed and is a definite medical problem.

2. The prognosis is generally good, as evidenced by leading authorities throughout the country.

3. The best treatment is prophylactic—which means routine Wassermann tests on all pregnant women and immediate, adequate treatment if positive, regardless of the stage of gestation.

4. Good histories, maternal Wassermanns and also blood tests of the infant in questionable cases will go a long way in the battle against congenital syphilis by assuring an early diagnosis. Do not rely upon the absence of stigmata in ruling it out.

5. Intensive, persistent, modern treatment bordering on adult doses (unless condition contraindicated this) and careful observation through puberty should be the by-word in congenital syphilis. This should include the arsenobenzols, and either bismuth or mercury, or both, in adequate doses.

6. The comparative study reveals a uniform similarity between the larger clinics and the one here, in admittance signs and symptoms and treatment. The results differ somewhat.

7. The cases presented give you a practical demonstration of what can be done with congenital syphilis.

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A PLEA FOR THE RADICAL TREATMENT OF INCOMPLETE ABORTION*

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PRESENT day medical literature devotes much space to the subject of abortion, its etiology and classification, but more particularly and with more emphasis to the question of its treatment.

There is very little, if any, notable difference of opinion concerning the treatment of threatened and inevitable abortions, but one might venture the statement, without much fear of contradiction, that there are two very distinct schools of opinion when the question of treatment of the incomplete type of abortion is under discussion. These might be called the conservative and the radical schools.

Neither method seems to be followed to the absolute exclusion of the other but most authors follow conservative methods for longer or shorter periods of time and then, when confronted by defeat, adopt the more radical treatment.

During the last five years I have had an excellent opportunity in my service at the Ancker Hospital to see an unusually large number of abortion cases of the incomplete type. At first and early in this work I adopted the curette as my method of treatment with a feeling of fear rather than with a desire to be conservative. I was soon impressed, however, with the remarkable cessation of uterine bleeding and cramps and the rapid convalescence which an instrumental curettage afforded my patients.

These excellent results prompted me to adopt this as the routine method of treatment, safeguarded by a few restrictions, and it is my purpose in presenting this thesis to give a clinical and statistical review of 235 cases of incomplete abortion which I personally curetted, and to note if the facts as revealed by such a survey harmonize in any degree with the mental impression that was gained while the work was being done; also to give my reasons for adopting the radical treatment.

The technic which I adopted was as follows: As soon as practical after admittance to the hospital, the patient is prepared localy and all blood clots and masses passed from the vagina are kept for inspection.

When the patient is under the anesthetic ready for the operation a second bimanual examination is made and she is given a hypodermic of 1 c.c. of pituitrin. The vagina is cleansed with alcohol, the cervix is steadied with a tenaculum and brought forward, care being taken not to make too much traction, and the os is dilated with a Goodell dilator if need be. Gentleness is exercised in inserting the curette into the uterus to avoid the possibility of perforating the organ. The tenaculum is always held by the operator; never by the assistant.

When the uterus is emptied of the remnants of the products of conception its interior is dried by inserting a packing of plain gauze. This is removed and another strip, soaked in 3 per cent iodine, is inserted. This is removed after a moment and a third strip is inserted. This last packing is removed after 24 hours and the patient is given a dram of the fluid extract of ergot, which medication is repeated after six hours.

The purpose of allowing a packing to remain *in situ* for 24 hours is to stimulate the uterus to contract, protect the patient against any possible bleeding and to facilitate the separation of any small remnants which might have been overlooked. The value of this may be over-estimated.

This method of treatment very likely would be endorsed by some authors; regarded perhaps as unnecessarily radical and hasty by others; and most severely criticised by a third group.

Gordon states that curettage often changes an aseptic case to a septic one and is seldom indicated and often harmful.

Child believes that the curette has no place in the treatment of abortion and condemns it severely, while Tovey thinks that the uterus

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should never be curetted. Yates thinks that the curette has killed more persons that it has saved.

Gordon resorts frequently to light vaginal packing which he is obliged to repeat in 20 per cent of his cases and is often obliged to do it a third time. He thinks that curettage may be indicated after a second or third packing. He treats conservatively until it fails and he admits failure in 4 per cent of his cases.

Healey criticises this conservatism, regards packing as not being without its danger, and that it often fails to loosen the product of conception and he favors a curettage as he thinks that there are fewer later complications. Aranow favors a curettage.

Hillis, even in the presence of a temperature, does not pack but empties the uterus with the least possible trauma and thinks that in his series of 1,000 cases curettage did not lengthen the febrile period. He thinks that expectant treatment in non-septic cases is doomed to failure in 40 per cent of cases.

The most frequent objections voiced against the radical treatment of incomplete abortion are the danger of perforation of the uterus; failure to remove all the remnants of the products of conception; damage to the uterine wall; and the fear of infection. On the other hand, many advocate the use of the index finger as the safer method. Magid uses the finger as soon as the os is open and Yates favors this method. Gellhorn thinks a sharp curette is far less violent than a blunt one and lodges the same criticism against the digital curettage.

Let us consider digital curettage first. Many cases of incomplete abortion that are sufficiently sick to be admitted to a hospital have rather large subinvoluted uteri with deep cavities, and at times the decidual remnants are still firmly attached. In order that the index finger may explore the whole of the uterine cavity and reach as high as the fundus, it is necessary that the operator insert his whole hand in the vagina and make firm pressure on the uterus in order to telescope it over the exploring finger. The finger must be of more than average length and one encounters the added difficulty of having the os plugged by the larger proximal end of the finger.

This is a dangerous procedure. When one recalls Sampson's work on the etiology of endometrosis and the possibility of the escape of the menstrual blood from the fimbriated ends of the tubes under the pressure of rather mild uterine contractions, it is easy to comprehend how it is very possible and highly probable while doing a digital curettage to force some of the uterine blood, mucus and other debris through the tubes and into the abdominal cavity. Furthermore, and as will be shown later in this discussion, this uterine material is often infected although the patient's temperature and the local condition might not suggest it.

Regarding the possibility and danger of a uterine perforation, it is a valuable safeguard to make a second bimanual examination while the patient is under the anesthetic and the administration of 1 c.c. of pituitrin at this time aids the uterus in its involution. While I encountered many retro-uteri with displacement of varying degrees, and many organs with deep cavities and soft doughy walls, it was not my harrowing experience to perforate a single uterus in this series of 235 cases.

It is true that if one were to subject the interior of the uterus to a microscopical examination after an instrumental curettage, no doubt many decidual and chorionic remnants could be found. This is theoretical and not practical. In this series of cases it was my embarrassment on only one occasion to be obliged to curette a patient the second time.

If one may regard the pathologist's reports as any criterion of the subject, one is impressed with the fact that the presence of uterine muscle in any abundance in the curettings is very infrequent; he reports it only once.

While on this subject perhaps I may be permitted to state that in not a single instance did the pathologist's report make mention of the presence of a fetus in the curettings.

The danger of infecting a patient through curetting is not great if one is careful of his technic and gives proper consideration to self-induced abortions and the presence of fever. Gordon regards his patient as septic if she has a rectal temperature above 101 or if the abortion was induced or if there have been subsequent intra-uterine manipulations. Gellhorn regards the treatment of criminal abortion as synonymous with sepsis and regards all septic abortions as criminal and thinks that 90 per cent of them should be so classed.

The point is often emphasized that while a

uterus can withstand the trauma and possible introduction of infection occasioned by a first dilatation of the internal os, it cannot withstand a second such dilatation. This may be true. But I take the stand that when a uterus is subinvoluted and bleeding and harboring foreign material in the form of remnants of the products of conception, which themselves are often undergoing degenerative changes, it is more beneficial to the patient and very safe indeed to dilate the internal os amidst the surroundings of a present day operating room and stimulate and assist this important pelvic organ to return to normal. Furthermore, in many of these cases the internal os is wide open, allowing infection free entrance to the interior of the uterus and it will continue to do so until the uterus is empty.

So, none of the objections so frequently raised against an instrumental curettage of the uterus in incomplete abortion is serious and cannot be avoided. On the other hand, there are some very excellent reasons why such a procedure is very appropriate and holds out many advantages to the patient. In the first place it shortens the patient's stay in the hospital. This shortened hospitalization and reduced expense occasioned thereby are important matters to the average patient and in this series of cases, all of whom were in a municipal institution, it lightens the load of the taxpayers.

These 235 cases spent 1,247 preoperative days in the hospital or an average of 5.3 days each. Sixty-eight patients, or 29 per cent, were in the hospital longer than this average period while 167, or 71 per cent, were in the hospital five days or less, but the largest number only three days. The only conservatism that I displayed here was occasioned by the desire to make a correct diagnosis before resorting to operation and to allow a temperature to return to normal for a safe period of time.

When the uterus is finally emptied of its contents three very apparent and important things take place. The depth of the uterine cavity, as measured by the distance that the curette enters, lessens perceptibly due to the contraction of the organ occasioned by stimulation of the manipulation and the oxytocic action of the pituitrin. The second change noted is that the uterine wall becomes thicker and firmer, and thirdly, there is decidedly less bleeding.

At this point it may prove of much interest to make an analysis of the pathologist's findings in the curettings sent to the laboratory. Immediately his findings permit division in two groups, non-inflammatory and the inflammatory. The former group contains villi, deciduæ and hypertrophic endometrium, either alone or in combination; the latter group contains inflammatory cells and exudate, degenerated and infected blood clots, white blood cell infiltration in combination with villi, deciduæ and hypertrophic endometrium. Out of 192 reports from the laboratory which are on record in this series, ninety-five would come in the non-inflammatory group, while ninety-seven would be classed in the inflammatory group.

With these facts arrayed before us, it becomes very difficult to regard any so-called conservative treatment which permits this material to remain in the uterus as being safe and sane. To allow this debris to remain in situ must invite an endometritis, prolong subinvolution and endanger the patient to a pelvic infection and invalidism. On the other hand, to remove this material removes a focus of infection; to allow the uterus to involute properly protects the patient against endometritis, myometritis, dysmenorrhea, menorrhagia and metrorrhagia, etc.; to control the uterine bleeding conserves the patient's energy and strength and enhances her chances for victory in her battle for restoration of health.

Furthermore, one must not overlook the fact that a hydatid mole with all its possibility of malignancy can arise from the chorionic villi of an incomplete abortion.

The post-operative results were very satisfactory. In the early part of this work I endeavored to keep all the patients in the hospital for a full week after curettage. But I became more liberal in this respect when some patients left the hospital earlier without any apparent bad results. The 235 patients in this series spent 1,625 post-operative days in the hospital, or an average of seven days each. Eighty-one per cent came in this group, while 19 per cent stayed longer than seven days, but the largest number only five days.

The American College of Surgeons, in defining post-partum morbidity, defines it as a condition of elevation of temperature to 100.4 during any two consecutive days post-partum, with the exception of the first day. While the post-operative state of these patients cannot rightly be regarded as post-partum, they have, nevertheless,

much in common. According to this definition I had thirteen cases of morbidity, or 5.5 per cent.

A further study of these cases is interesting. According to this definition they all exhibited a preoperative morbidity although the temperature may not have been as high or lasted as long as it did postoperatively. The average preoperative days of hospitalization in the morbidity cases was 8.75 days, while the post-operative hospitalization was 15 days, which figures are both much higher than the average for the whole series. The average number of days preoperative in which the morbidity patients were afebrile was 2.25 days; the longest was five days. Hillis emphasizes the value and importance of at least a 5-day afebrile period before operation and states that there is less postoperative fever if this is adhered to. Tuttle experienced that febrile cases operated on promptly had a higher average of postoperative febrile days.

One patient was in the hospital for seven weeks before operation with only four afebrile days and 25 days after operation with 17 afebrile days. Her convalescence was interrupted by an ice bag burn. Another patient had 3 afebrile days before operation and developed a pelvic abscess which was drained vaginally 17 days after curettage, following which she improved rapidly. These two cases exhibited the outstanding morbidity, 0.8 per cent.

I made several mistakes. While all of these curettages were done because of a diagnosis of incomplete abortion, the pathologist's report failed to substantiate that diagnosis in several cases. He reported chronic endometritis in one case; acute endometritis in two cases; normal endometrium in three cases; uterine muscle fibres in one case and necrotic mass in two cases. This last may have been the result of an incomplete abortion. I anesthetized one patient for operation who had a pedunculated submucous fibroid. One patient, as stated earlier in the paper, had to submit to a second curettage. There were no deaths in this series of 235 cases.

I regret that I did not follow the routine practice of making a pelvic examination before discharging the patient. The findings would have lent themselves admirably to a fuller discussion of this subject. Questionnaires were mailed but only fifty-six replies were received. Two sets of questions were asked. The first set dealt with the possible development of pelvic trouble as a result of the curettage while the second had to do with the patient's future pregnancy, if any.

Comparing and analyzing the answers of those whose reply suggested a possible pelvic pathology, I am not convinced that any of them suffered any bad results. Seven patients reported some bleeding after leaving the hospital; two no doubt had reference to menstrual periods while five of these reported a subsequent pregnancy, four of them miscarrying. Eleven of the patients thought that they had developed a leukorrhea, seven of these reporting a subsequent pregnancy, four going to full term. Five reported changes in their menses, three miscarrying when they became pregnant. Three reported pelvic trouble, of which one went to full term in her subsequent pregnancy and a bimanual examination showed a negative pelvis. Another one was in need of a pelvic repair which she has had done since then.

In the second set of questions, which dealt with a possible subsequent pregnancy, I find that 50 per cent of the replies received showed a pregnancy after the curettage, of which 63 per cent either went to full term or were pregnant when they answered the questionnaire.

This analysis, although not based on a large series, convinces me that a carefully safeguarded curettage for incomplete abortion does not lend itself as an etiologic factor in the production of pelvic pathology or sterility.

Conclusions.—Curettage of the uterus for incomplete abortion with a sharp curette, as was done in this series of cases, is a safe and justifiable procedure.

Certainty of diagnosis, a definite afebrile preoperative period of about five days and care in technic are very important.

To empty the uterus of its foreign and infected material, stimulating it to contract and controlling the bleeding, safeguards the patient, shortens her stay in the hospital, conserves her energy and enhances her chances of recovery.

Perforation of the uterus can be avoided and the danger of incompletely emptying the uterus is overestimated.

Digital curettage is an unsatisfactory and dangerous substitute operation.

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PROPAGANDA FOR REFORM

Ampoule No. 61 Sodium Salicylate 15 1/2 Grains, Ampoule No. 66X Sodium Salicylate, Sodium Iodide 15 1/2 Grains Each, Ampoule No. 66X Sodium Salicylate, Sodium Iodide and Colchicine, and Ampoule No. 50 Iron and Arsenic (Iron Cacodylate) 1 Grain, Not Acceptable for N.N.R.—The Council on Pharmacy and Chemistry reports that these are included in the list of ampoules for intravenous use marketed by the Lakeside Laboratories, Inc., Milwaukee. In 1921, in reporting on "Some of Loeser's Intravenous Solutions," the Council stated the objections to the intravenous administration of sodium salicylate and sodium iodide and of mixtures of drugs in fixed proportions. Since this time no evidence in favor of the routine intravenous administration of sodium salicylate or of sodium iodide has been brought forward, and the objections to the fixed proportion mixtures applies to the mixtures listed in this report. Ampoule No. 50 Iron and Arsenic (Iron Cacodylate) is unacceptable because the name is nondescriptive; because recommendations for the routine intravenous use of iron are not warranted, and because iron cacodylate presents an irrational and useless method of the administration of iron and arsenic. The Council declared Ampoule No. 61 Sodium Salicylate 15½ grains, Ampoule No. 59 Sodium Iodide 15½ grains, Ampoule No. 66X Sodium Salicylate, Sodium Iodide 15½ grains each, Ampoule No. 66 Sodium Salicylate, Sodium Iodide and Colchicine, and Ampoule No. 50 Iron and Arsenic (Iron Cacodylate) 1 grain unacceptable for New and Non-official Remedies because recommendations for the routine intravenous administration of sodium salicylate and sodium iodide are not warranted and because the administration of sodium salicylate and sodium iodide, of sodium salicylate, sodium iodide and colchicine in fixed proportion and of iron and arsenic in the form of ferric cacodylate whether intravenously or otherwise is irrational. (Jour. A. M. A., January 4, 1930, p. 31.)

Excretion of Barbital.—Sir Maurice Craig holds that barbital preparations may be taken for years without producing deleterious effects. This view has received some experimental verification. On the other hand it has been held that in certain conditions—Manic-depressive insanity, constitutional psychopathic inferiority and psychoneuroses—its use may lead to habit formation and that to such patients these drugs should never be administered. (Jour. A. M. A., January 4, 1930, p. 35.)

Pituitary-Solution-Squibb 1 c.c., 5 Units, and Pituitary Solution-Squibb 1 c.c., 20 Units, Not Acceptable for N.N.R.—E. R. Squibb & Sons market Pituitary Solution-Squibb 1 c.c., 5 units, and Pituitary Solution-Squibb 1 c.c., 20 units. The first product is one-half the strength of solution of pituitary-U.S.P., while the second is twice the strength. The Council holds that it is not in the interest of rational therapy to market strengths different from that of the standard pharmacopeial product and therefore cannot give recognition to such preparations. Accordingly, the Council declared these Squibb preparations unacceptable for New and Non-official Remedies. (Jour. A. M. A., January 11, 1930, p. 105.)

Resuscitations and Intracardiac Injections.—The power to revive the dead is one that the physician is often, but vainly, expected to exhibit. The alleged miracles of such revivals by injecting epinephrine into the heart are always widely reported in the newspapers. Physicians who have heard of these alleged resuscitations are tempted to employ the same means. If the death was real, no harm and no benefit results. Revival follows sometimes, perhaps not because of the treatment but in spite of it. In such cases there is indeed grave danger that serious injury may follow from the treatment that the patient has received. The evidence seems conclusive that, if the patient revives after such an intracardiac injection, he would have revived without it. Intracardiac injection is not a justifiable measure for resuscitation. (Jour. A. M. A., January 11, 1930, p. 107.)

Cod Liver Oil Viosterol or Sunlight for Rickets.—Cod liver oil, viosterol and ultraviolet rays are generally accepted as specific agents in the prevention and cure of active rickets in infants. Their relative merits are still under investigation. Cod liver oil contains the valuable vitamin A in addition to vitamin D. Viosterol is of advantage because of the ease of administration and its concentration. Ultraviolet rays are undoubtedly a valuable therapeutic agent when under controlled supervision. Their effect on general nutrition and resistance as well as on the calcium retention is good. Their use to the exclusion of vitamin D or viosterol seems unwise. A combination seems most desirable when sunshine is not available. (Jour. A. M. A., January 25, 1930, p. 283.)

CORBUS' DISEASE

REPORT OF TWO CASES

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EROSIVE or gangrenous balanitis was first described by Bataille and Berdal in 1889. Their work was confirmed by Scherber and Muller in 1904. The disease, however, was not recognized as an entity until Corbus and Harris, working in the United States, established it on a clinical and pathological basis as a fourth venereal disease. In 1909 they defined it as "a specific infectious venereal disease, caused by a symbiosis of a vibrio and a spirochete, with local and constitutional symptoms varying with the severity of the infection."

The disease is pratically limited to those of unclean habits. Predisposing causes are: (1) long, tight foreskin which excludes the air; (2) moistening the genitalia with saliva. As the organism is anaërobic, it can only occur in those who have not been circumcised. In most cases a history of unnatural sexual relations, or of moistening the genitalia with saliva may be obtained.

The specific organisms of this disease are a vibrio and a spirochete. Microscopically and morphologically they are identical with Vincent's organisms. Whether they are the same organism is still a debated point. They grow under anaerobic conditions on serum agar and stain with ordinary dyes. The vibrio is gram-positive and the spirochete gram-negative.

The pathology begins with an erosion usually in the sulcus coronarius. It spreads rapidly to the foreskin and glans, ulceration becomes widespread and gangrene of a large part or the whole of the penis occurs if not treated promptly.

These greyish and hollow ulcers may be single or multiple. There is itching and burning under the foreskin, but no pain on micturition. The foreskin may be retracted without difficulty and constitutional symptoms are absent.

As the condition progresses the ulcers deepen and become irregular in outline. They tend to become confluent, forming ulcers from one to one and a half centimeters in diameter. The bases are irregular and covered with a necrotic yellowish white or brown pseudo-membrane. The edges are clean cut and slightly raised. The foreskin is edematous and cannot be retracted. There is a thin, yellowish white foul discharge in which the specific organisms can always be found.

Venous stasis and thrombosis supervenes, due to the edema. The overlying skin becomes dark and finally black and necrotic. If not treated energetically the entire penis becomes involved in this process. The entire penis becomes enormously edematous, the dorsal lymph cord is palpable and the inguinal glands are enlarged. As a rule, however, they are not painful.

Constitutional symptoms at this stage are very often severe. Vomiting, headache, general malaise, chills and fever with a temperature of 100-101 are common.

If untreated the whole penis and scrotum becomes a black, sloughing mass. The patient gradually dies from toxemia.

Differential diagnosis is important so as to institute the proper treatment early. Chancroid may resemble it closely but does not spread with the same rapidity. Microscopic examination of the smears moreover show Ducrey's bacillus. Painful suppurating glands are common in chancroid, whereas in gangrenous balanitis the enlarged inguinal glands are painless and do not suppurate.

The hard chancre of syphilis comes on later and is more indurated. The type of spirochete may also be differentiated by dark field examination.

The treatment in the early stages is frequent cleansing and exposure to the air. When there is edema of any extent present, the preputial sac should be irrigated every half hour with some mild oxidizing agent such as hydrogen peroxide 2 per cent, or potassium permanganate 1/4000, until the condition subsides. This is done most conveniently with a Guyon catheter attached to an all-glass syringe. Cold applications of Dakin's solution in the intervals are excellent.

If the foreskin is gangrenous, enough should be removed to expose the ulcers freely. Some advise using the cautery for this purpose. A continuous irrigation, similar to the Murphy drip method, is commenced, the tube being fixed in a light dressing over the penis. Within forty-eight hours there is a marked improvement, both local and general. Any further necrotic areas slough away and the patient is left wholly or partially circumcised.

The following two cases are reported for the purpose of showing, in the first case, the usual course of the disease, and, in the second, some unusual and interesting features.

Case 1.—F. H., aged 28, was admitted July 2, 1928, to the observation ward at the Winnipeg General Hospital with pain, swelling and edema of the foreskin. The skin over the dorsum of the glans was quite black. His temperature was 100, but his general condition good.

Six days previous to admission his symptoms began with itching and burning under the foreskin. His symptoms gradually became worse until, after five days, the skin over the dorsal surface of the glans penis became black.

On admission the entire penis was edematous, the foreskin over the dorsum of the glans black and gangrenous with a thin and extremely offensive pus exuding from beneath it. The foreskin could not be retracted. A smear of the discharge showed spirochetes and fusiform bacilli.

He was put on alternate irrigations of hydrogen peroxide and 1/4000 potassium permanganate every half hour, cold compresses being applied continuously in the intervals.

By July 3, the gangrenous portion of the foreskin had sloughed entirely, exposing several large ulcers on the glans and sulcus.

In spite of a negative Wassermann, the patient was given .45 novarsenobenzol intravenously, and some of the novarsenobenzol powder was dusted on the ulcers directly. A continuous drip of 1/4000 permanganate was started. Temperature 100.6, general condition good.

On July 4, the ulcers appeared much cleaner. Temperature 99. Smears from the mouth reported positive for Vincent's organisms. The patient admitted moistening the penis with saliva.

The following day the temperature was normal, the ulcers were healing well and the general condition was good.

July 13. Temperature still remained normal. The ulcers were practically healed. The potassium permanganate drip was discontinued and the patient was allowed up.

By July 16 only very small ulcers covered with dry crusts remained. The patient has lost only that portion of the foreskin which was gangrenous on admission. He was discharged in good condition.

Case 2.—F. Z., aged 46, was admitted to St. Joseph's hospital Feb. 11, 1928, with a temperature of 102, pulse 128 and respiration 32.

The patient stated that ten days previous he froze his penis while working in the bush. The first thing he complained of following this was a soreness under the foreskin. He held a consultation with a fellow workman, who advised painting it with iodine. This treatment was carried out. The following morning the penis was very sore and very swollen at the end. This was one week ago and the swelling has progressed.

The penis was swollen up to the base to a diameter of 1.5-2 inches and was about six inches long. The skin was thick, edematous, firm and did not pit readily on pressure. A cough was present and the breath offensive.

I first saw the patient on February 13, twelve days after the onset of the infection. At that time the penis was tremendously swollen and the swelling and edema had extended over the entire front half of the scrotum. There was a slight seropurulent discharge from the under surface of the foreskin, but the edema was so great that the glans could not be seen. There was a small area on the dorsum of the foreskin which was dark in color. The man's general condition was very poor. His respiration could be heard over the entire ward and he was cyanosed. Percussion yielded no dullness but both lungs were full of coarse râles from apex to base. The heart was not enlarged but the heart sounds were of poor quality. The patient's temperature was 100, and his pulse ranged from 120 to 140.

It was felt that a dorsal slit offered probably the best chance of saving the penis, and this together with two incisions into the scrotum was made under sacral anesthesia at once.

In the first twenty-four hours following the incising, the actual nature of the disease was not recognized. Smears taken and planted in an anaërobic medium yielded a mixed growth of bacteria. The wound was fomented and the patient was put on brandy and digitalis. The afternoon of the operation the patient had a smart hemorrhage which was arrested without difficulty.

After forty-eight hours the condition was recognized as probably a very severe form of Corbus' disease. It was thought that the lung condition was an entirely different process arising from exposure and cold. Dakin's compresses and irrigations were commenced and fluids pushed to 3,000 c.c. daily.

Within seventy-two hours from the time of incision, the entire skin covering the penis and anterior surface of scrotum became black and gangrenous. At the end of the fifth day the whole mass sloughed away leaving the shaft of the penis completely uncovered and the testicles exposed.

The shaft of the penis was found to be necrotic also. It was evident that the penis was going to slough probably as far as the triangular ligament. The patient's general condition was extremely bad. The temperature varied from 97 to 103, pulse 100-140 and respiration 30 to 50 per minute. The patient was delirious at

least half the time. Examination of the chest revealed the lungs full of râles and some increase in heart dullness. The patient's condition was such as to prohibit any thorough examination.

On February 21st the penis dropped off level with what was apparently the triangular ligament (Fig. 1).



Fig. 1.

The Dakin's compresses were continued alternating with carbonlight and the wound gradually became quite clean and a mass of granulations.

The patient's temperature gradually subsided, his pulse came down to about 110 and his general appearance improved. On March 1, 1928, he complained of a sore thumb. It was tender on pressure and was dull red over an area the size of an American nickel. The spot was black by the next day and was incised and Dakin's compresses applied. The patient's condition remained unchanged until ten P. M. March 4th, when he suddenly died.

POST MORTEM FINDINGS (DR. O. C. TRAINER)

There has been a gangrenous process of the penis and scrotum which has resulted in a complete sloughing of the penis level with the triangular ligament and partial sloughing of the scrotum involving chiefly the anterior wall.

On removing the anterior chest wall a large abscess is seen to occupy the antero-superior part of the mediastinum, involving the pericardium and encroaching on the medial aspect of the right lung. This part of the lung is necrotic and partially sloughed away. The abscess is filled with a foul smelling necrotic mass.

Smears from the mediastinal abscess and from the genitalia show large numbers of a fusiform bacillus and a spirillum resembling Vincent's organism. Cultures showed mixed growth of staphylococcus aureus and streptococci.

These two cases are reported for the purpose of putting on record the latter case, in which apparently the original lesion in the genitalia gave rise to secondary infection of the lungs and mediastinum.

Although we were unable to grow the Vincent's organisms in the one culture planted, we feel that this is a true case of Corbus' disease.

VAGINAL STERILIZATION

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A LARGE variety of pathogens have been found in the genital tract following delivery: *streptococci pyogenes* and *hemolyticus, staphylococcus pyogenes, bacillus coli communis,* gonococcus, pneumococcus, *B. diphtheriæ, B. typhosus, B. tetanus, B. erogenos capsulatus, B. pyocyaneus, micrococcus tetragenus, staphylococcus parvulus* and other putrefactive organisms as *B. funduliformis, B. radiiformis, B. proteus,* and anaërobic streptococci which have been held responsible for fever and death.

The question as to how these organisms enter the birth canal is important since with this knowledge it may be possible to prevent such entry. Many investigations have been made to determine the bacterial content of the vagina and uterus and show that these organs are, with few exceptions, free from pathogens. The uterus, cervix and upper portion of the vagina normally have no pathogenic content.

It has been demonstrated that the introduction into the vagina of any object, sterile or contaminated, will carry with it bacteria. This may be accomplished by the physician, nurse, midwife, or patient through vaginal examinations, douche nozzles or instruments. How much time is required for the vagina to resume its normal state, free from organisms, after contamination seems an unsettled subject. It probably depends on the number of organisms introduced, the virulence of the bacteria, the condition of the patient, and the condition of the generative tract, whether infected or filled with vegetative matter. Some authors recommend that the patient refrain from coitus during the last few days prior to labor: others, a period of six weeks. This must indicate that in the experience of these advisors, the introduction of contamination requires approximately that interval for control.

The present trend of obstetric teaching is to avoid the passage of any object into the field of labor for some period before labor, and presupposes that the lower uterine segment, cervix, and vagina are sterile when the patient enters the hospital. Still applying the same reasoning, all effort is made to see that the labor is attended by no vaginal examinations, and as little instrumentation as is compatible with the life and health of the mother and child, during that particular labor. If, then, infection occurs, it is stated that outside influence was responsible for the introduction of bacteria. If death from infection occurs, the statement is made that the attendant is responsible for the death. This, in spite of the fact that since the time of Holmes and Semmelweiss, a concentrated effort has been made to avoid introducing anything into the obstetric field.

In Lea's masterly review[1] of puerperal infection is given an extensive account of the deaths from this cause in England and Wales and a slightly lesser study of these deaths in various parts of Europe. In this country, a somewhat similar exposition has been made by McGlinn[2] and others. They show that 35 to 48 per cent of all maternal deaths are due to puerperal infection. Various explanations are made as to why infection follows childbirths, and is so severe as to cause many deaths. Even with the large majority of medical men graduating from first rate medical schools and with most of the obstetricians realizing that the entry of the vagina manually or instrumentally means infection, still infections occur. Not only do infections occur in cases subjected to vaginal interference but it also appears in some cases which are in every way delivered ideally. Death from infection is known to result where there has been no vaginal examination, no instrumentation, no accidents of labor and no lacerations.

We tend to blind ourselves by believing that the bacteria have been introduced before the patient came under our attention. But if such a thing has occurred, what does that mean to us? It means simply this,—we are dealing with an *Infected Field.* Every obstetric case that enters our professional care is potentially infected before we see the case on the delivery table. We cannot know beforehand what case will develop fever. The patient may deliver very promptly, with no apparent abnormality and subsequently die of infection. Is this the doctor's fault? Is

it the fault of the attendant when the best technic known is applied to a labor and the patient dies of infection?

Of course there are occasional epidemics of infection, such as occurred in the Sloane Hospital in 1927, which clearly implicate the attendant as an agent in carrying outside infection to the obstetric patient. But this again is a factor for potential infection which must be faced by every hospital in the country. Is there nothing that can be done to counteract the potential infection present in every obstetric case?

There are two sources of bacterial invasion in the parturient patient: (1) Infection present in another part of the patient's body which may spread to the labor wound (through blood, lymph or contiguity); (2) infection present in the birth canal (already present or introduced shortly before labor) which may spread to the labor wound. By careful prenatal attention, every effort is made to bring the mother through the period of gestation with the elimination of infection in any part of her body. Accurate instruction is given her how to avoid the possible presence of infection in the vagina previous to labor; and, finally, labor is so conducted as to minimize the possibility of bacterial invasion during parturition and puerperium. These efforts are not without their results, but an occasional case will slip through this close attention, and an infection result in a fatal outcome; and, to all appearances, this is in spite of the most religious application of our most advanced scientific management.

What is to be done with the potentially infected maternity patient? Every mother is potentially infected.

Every labor presents a wound. The woman's natural recuperative processes, especially in the usual absence of bacteria, result in complete return to normal in a few weeks' time. But if bacteria are present, the mother's resistance may be taxed to the utmost.

The character of the labor has much influence on a potential infection. The presence of toxemia in a mother is a known agent for increasing the possibility of infection. A long labor with need for surgical interference adds a few points to the already high percentage possibility of infection. Lacerations of all sorts in the perineum or cervix, both of which are such common points of stress during labor, open the weakened tissues to direct bacterial action. If the membranes rupture early, or there is a placenta previa or, from other causes, blood in the birth canal before labor, there is an increased likelihood of infection. The crushing of soft parts against a deformed pelvis, even without rupture of the uterus, may result in direct extension of infection to the peritoneum.

The type and number of organisms and the point of entry determine the localization and character of the infectious lesion—whether it be abscess, phlegmon or thrombus.

We know that with our best efforts to prevent infection, it will occur in a small percentage of all cases. Of the febrile patients, some will die. After the infection has started it is too late to expect to accomplish much by radical procedures.

The time to deal with puerperal infection is before the labor is accomplished, while we know we are dealing with a potentially infected field.

We would not undertake a surgical operation without first making every effort to destroy the bacteria which might gain entrance into the wound. Yet we deliver a patient, following which we know there will result a large obstetric wound through a field which we know beforehand may contain bacteria, without any effort to destroy the bacteria we suspect to be present. Studies on the aseptic vaginal examination show that after this method of procedure, the number of postpartum infections have doubled. Proof more positive could not be presented that these additional infections have come from bacteria already present in the vagina. Yet no effort is made to destroy these bacteria. We introduce a bag aseptically, dilate manually aseptically, perform instrumentation aseptically, and as a result treble the postpartum infections over what would be present in the normal spontaneous delivery. We can give no more certain evidence of the presence of bacteria in the vagina than these figures. The bag had on it no bacteria; the hand was gloved and sterile; the instrument certainly was not contaminated. What happened to double and treble the infections. Bacteria already present have been carried from the lower portions of the vagina to the higher levels—closer to the obstetric wound.

Yet these maneuvers are performed aseptically —not antiseptically. No effort is made to destroy these bacteria which are without question responsible for the additional infections in these cases.

Why should not a field which is not sterile, and is about to be the site of a formidable injury, with expectation of exposing the body to the ravages of micro-organisms which are known to be present, be rendered as sterile as the present knowledge of antiseptics will permit? Why is it considered unscientific to prepare a patient for an ordeal with the greatest protection we can offer—the destruction of the bacteria which may cost her life?

These questions have appealed to other observers in former times—Zweifel,[4] Schweitzer, Esch, Schröder, von Herff and others. Effort has been made to sterilize the vagina using douches and antiseptic preparations. Because these efforts failed, and some of them increased the percentage of infections, all attempts were dismissed as useless or even harmful. But a conscientious study of the actions of antiseptics on mucous membranes shows that the requirements of disinfection of mucous membrane are somewhat different from those that apply to the external skin. The antiseptic which sterilizes the skin may injure the mucous membrane, cause it to become swollen, parched, dry, cracked, fissured, and expose it to further invasion of the bacteria which unquestionably will grow again in larger form and numbers when nourished back to life (after the passing of the bactericidal action) by the excellent culture medium of the body fluids seeping through this injured mucosa heated to the optimum temperature of the body. When such a strong antiseptic was applied to the obstetric patient, it is little wonder that the number of infections increased. Another factor which has done much to wave aside any suggested further investigation of this field, by even the most courageous of scientific advocates, has been the very thing which first reduced the morbidity to its present figure—the work of Holmes and Semmelweiss. So thoroughly has their thought been impressed upon us, that we cling to the opinion that nothing—not even a suitable antiseptic—must be conveyed into the vagina.

This, however, is contrary to our own honest judgment. If we will consider a little, we must see clearly that an antiseptic non-injurious to the mucosa, non-toxic, bactericidal, introduced into the obstetric field often enough during parturition to destroy or vitiate pathogenic entry into the obstetric wound must reduce to a minimum any possible source of infection through the birth canal. We cannot prevent the spread of hematogenous, lymphatic or contiguous (ovary, tubes, etc.) infection when it is already present in the patient's body, and the obstetric wound is open, offering such splendid pabulum to circulating organisms.

It remains for us then to consider the subject of the preparation of the obstetric patient for the delivery of the fetus. The manner of preparation is sometimes fruitful of trouble. In some hospitals, one observes that after shaving the perineum, the abdomen, thighs and perineum are carefully washed with soap and water: the excess of cleansing fluid is flushed away by pouring water over the abdomen, thighs and perineum. Finally, this water is poured over the vulva. If one inserts a speculum into the vagina after such a preparation, water will be found in the vault of the vagina. This water has entered through the introitus, carrying with it bacteria from the vestibule, labia binora, majora and clitoris. For this reason, a sponge must be held over the introitus so that no cleansing fluid enters the vagina. The antiseptic is painted on beginning with the labia minora, and is applied laterally, in either direction, until the entire perineum and portions of the abdomen and thighs are well covered. The attention to the anal region is last given and no other part of the skin is touched with that sponge, once the anus is touched. If more antiseptic is desired, a clean sponge is taken.

The labia minora (which have been painted) are carefully separated, and the vestibule is thoroughly saturated with the antiseptic. Finally, a clean sponge soaked with antiseptic in inserted into the vagina just at the aperture. Then with sterile gloved fingers separating the vaginal aperture antiseptic fluid is introduced into the vaginal canal, and the gloved sterile fingers work this well into the mucosa of the entire vagina. This application may be made through a speculum if so desired, as the leaves of the speculum iron out the rugæ of the vaginal walls. If labor continues for any length of time, this preparation must be repeated every eight to twelve hours, depending on the type of antiseptic and the length of its action.

A study of the various types of antiseptics shows that at present the most advantageous drugs for mucosal sterilizing are hexylresorcinol and mercurochrome. Recently a product known

as merthiolate has been advanced with experimental data that place it on a par with those mentioned above. Hexylresorcinol depends for its action upon its physical properties, and will not act unless it comes in contact with the bacterium in sufficiently strong solution to dissolve the germ. Mercurochrome, and apparently merthiolate, depends upon chemical action, and is germicidal in very weak solutions. For this reason I have utilized mercurochrome, though other men, engaged in the same effort, have apparently secured equally good results from hexylresorcinol. No clinical application has as yet been made of merthiolate.

Harry Mayes[3] has developed a technic using 4 per cent aqueous solution of mercurochrome and painting this over the perineum and introducing 4 c.c. into the vagina, working this in gently with the gloved fingers.

My own method, started before I was aware of Mayes' work, is to paint over the perineum a 10 per cent solution of mercurochrome, and introduce into the vagina a solution of glycerine (5 c.c.) containing enough mercurochrome to make 5 per cent and iodine 1 per cent.

Other methods have usually made use of iodine solution over the perineum, removing this with sodium thiosulphate or alcohol, or using alcohol alone over the perineum, but these drugs are too irritating to introduce into the vagina.

From the figures presented by Mayes and his co-workers and from my own experience, the morbidity in obstetrics has been reduced one-half or more.

It is to be recognized that the ideal method of antiseptic preparation has not been produced. What we have at present to work with may not be properly applied. Both the technic of application and the drug itself will be changed in the future advance of scientific attainment.

Summary.—We have attained the highest excellence in our methods of preparing our rooms, instruments and apparatus. We are most exact in the management of labor, but we fail to remove from the birth canal the pathogenic bacteria which are present in a few cases. After shaving, cleansing and sterilizing the perineum, by introducing into the vagina antiseptic solutions, mild enough to be non-injurious to the mucous membrane, but strong enough to kill or vitiate pathogenic bacteria, by repeating this application often enough to allow no recovery of the bacteria during labor we may leave to the maternal body an easier recovery, with less likelihood of postpartum infections as shown by the consideration given in the above discussion.

Conclusions.—There is need for more investigation along the lines of antiseptics for use on mucous membranes. If an efficient mild antiseptic, non-injurious to the mucosa but bactericidal, is applied to the perineum, vulva, and vaginal mucosa, and repeated at intervals during parturition, infections during the puerperium will be reduced approximately 50 per cent.

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WHEN IS A HYPERPLASTIC SINUS, AND WHAT? AND ITS PARALLEL, THE MUCOID EAR

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THE title of this paper is, I believe, the feeling of the majority of the profession and, too, of the average rhinologist insofar as the application of his knowledge of the condition goes, in ready, definite clinical recognition and correct estimation of so-called hyperplastic, non-suppurative paranasal sinus disease.

Many years, successively, of groundwork and preparation under competent control, of continuous fraternal contact in the specialty, and with average intelligence, maybe, have failed to qualify me to the extent of being able to pronounce a nose "positively negative" after examination by the usual, accepted methods; and I believe that internists generally are beginning to feel that way toward others upon receiving such report from their rhinologist consultant.

A nose that shows little or nothing by clinical inspection, anteriorly and posteriorly, either before or after shrinkage, or after suction, by puncture and irrigation, or definitely enough by transillumination, or even by simple, unaided radiography, but may still hold a diseased sinus which is a depot of poisoning, has long been a constant dread to many of us, largely as a result of Sluder's writing concerning posterior nasal pathology, but never so thoroughly appreciated until the advent of iodized oil in radiography.

The culprit in this blind, blank chapter of rhinology has been the non-suppurative, so-called hyperplastic sinusitis, better named, I think, mucoid sinusitis, at least in part of its course, and, like its parallel condition, mucoid otitis media, a bugaboo, also, in otology.

Neuman, several years ago, in spite of considerable contradiction by his fellow workers in Vienna, established well the separate clinical entity of mucoid middle-ear disease and its altogether different needs, both in recognition and handling, from the serous and suppurative forms. His demonstrations were positive and indisputable in diagnosis and treatment, and I am sure have never been forgotten by any member of his classes.

When this great difference in middle-ear affections is so manifest by direct visibility and in experience in handling them, surely, then, a parallel condition is to be met in anatomically and physiologically corresponding structures; and it does exist in the nose, but recognition is infinitely more difficult and, comparatively, largely by deduction, and its satisfactory treatment is correspondingly difficult.

This parallel condition in the ear, so much more accessible for observation and study, can better be considered at the outset.

Serous exudate in the middle ear, if it stops short of suppuration, is absorbed with comparatively little damage to the sound-conducting mechanism; and hearing acuity, upon each inflation, is immediately restored.

A suppurative exudate, too, even if not liberated by paracentesis, will liberate itself by localized necrosis and rupture of the drum; and, though it does some damage to the sound-conducting mechanism, yet recovery is comparatively complete, including hearing acuity, in the majority of cases.

With the mucoid exudate, on the other hand, different from the other two types in every way, the hearing acuity is not restored, nor even improved, in inflation. Neither will it liberate itself by spontaneous rupture. It will, unless removed by incision of the drum and forceful suction, remain permanently in the middle-ear spaces, to organize later into that most fatal condition to the hearing function known to us all as adhesive process, which collects the largest toll of all otitic pathology and for the most part is responsible for that ever-increasing army of the "hard of hearing."

The mucoid ear, like the mucoid nasal sinus, only too often goes unrecognized by otologists, not to mention pediatricians and general practitioners. The dull, gray drum, slightly thickened and a little leathery, with little noticeable congestion, but with partially obscured markings (short process, umbo and folds), is the picture of this very mucoid ear that slips by unrecognized until

it is irretrievably too late to save its hearing acuity.

If this functional damage, above considered in the ear, were all there was to be confronted in consideration of the condition both in the nasal sinuses and in the ear, but especially in the former, it would be a small matter as compared to the far-reaching systemic damage complicating its existence in those two localities.

Except in local or neighboring pathologic processes the mucoid ear, as well as the mucoid sinus, according to my observation, experience and belief, is responsible for tremendously more systemic poisoning than is the suppurative form of disease.

The presence of suppuration in itself indicates at least attempted local defense on the part of affected structures, which also means helpful protection for the whole systemic organism. But no such apparent local inflammatory process of defense is in evidence in mucoid disease of either the ear or sinuses.

To be sure, suppurative metastases do occur at remote localities as a result of suppurative ear and sinus disease, but not to the extent that low-grade systemic poisoning is seen in chronic arthritic disease, neuritis, myositis, low-grade iridocyclitis, and so on, which to my mind is due to the largely unsuspected mucoid affections so difficult of recognition, especially in the paranasal sinuses.

What is more common to the otologist of experience and to the pediatrician than to see low-grade arthritic symptoms in children clear up promptly upon the recognition and relief of an unsuspected mucoid middle ear, with no other evidence than a "dull, gray drum, slightly thickened and a little leathery, with little noticeable congestion, but partially obscured markings"?

And, similarly, this is, I believe, the condition in the nasal sinuses, almost impossible of recognition, that, existing indefinitely, is often responible for progressive arthritis deformans, upon which in such cases rhinologist after rhinologist has reported "nasal sinuses negative."

Dean's writing, more than anyone else's, has resulted in attentive observation in these cases on the part of pediatricians. One sentence by Sluder, in the preface of his book, "The cessation of nasal suppuration is not always the cure of the case," has volumes of significance in the consideration of this subject, and fits perfectly into my conception of mucoid-sinus disease.

Hajek, in his book, speaks of hyperplastic sinusitis in connection with ethmoid disease only, and I think most of us, likewise, think of it only in that connection and, too, mostly as a bone process where such pathology is comparatively easy of recognition and demonstration, clinically as well as in the laboratory.

That such hyperplasia in bone, as well as in soft tissues, does take place in the other sinuses, too, has been brought out best and for the most part by Sluder. And while bone involvement, in consideration of headaches, may be a matter of "specificity of locality" (pressure upon neighboring structures), yet in consideration of systemic toxicity the process is simply a matter of pathologic activity (retention, chemical change, decomposition, absorption).

Nor is genuine hyperplasia localized necessarily to the ethmoids or to any one portion of the nasal surfaces, for Onidi and Wright, in the laboratory, show that the same pathologic process is found in the region of the bulla and uncinate process. That ozena and atrophic rhinitis are the end-result of such pathology, disseminated over sharply defined portions, or throughout the entire half or whole of the nose, corresponding to the portions adjacent to affected sinuses, would seem to be the most acceptable conclusion. As atrophy in all tissues begins just one step beyond ultimate or extreme hypertrophy, likewise it would follow that hyperplasia, which is really more rapid and more unstable hypertrophy than the usual form of hypertrophy, would be a point of election for subsequent atrophy.

It is further pointed out that nowhere else in the animal organism is bone and its periosteal covering so closely adjacent to chronically diseased surfaces as in the nose. As a consequence, the periosteum, which is the most essential nutritive medium of the bone as a whole, very soon reflects its own involvement in the disease process by the ensuing atrophy of the whole structure.

The presence of polyps and polypoid tissue in the nasal chambers by direct inspection might point, by deduction, to a corresponding condition in the adjacent sinuses, but, inversely, the difficulty is that the absence, by direct inspection, of visible disease in the nasal chambers, in the early stages of the disease, would not and can not exclude the existence of a hyperplastic or mucoid process that may be found in the sinuses, which

is so frequently not suspected by the average rhinologist. This difficulty in recognition, frequent enough in anterior nasal disease, is, of course, much greater in posterior nasal conditions.

Wright's description, in Sluder's book, of the process of spongification and absorption of normal bone in the nose, with replacement by new scar tissue of hyperplastic change, fits perfectly, it seems to me, with the accepted idea of the change in the bony capsule of the labyrinth in otosclerosis, and adds much to the parallelism of the condition in these two localities. The two localities, after all, are one and the same system of mucous-lined air spaces, and must be susceptible to the same pathologic changes.

Nasal pathology, at least in our section of the country, is mostly the result of the unnatural, precipitate change in the atmospheric-temperature living conditions that we are subjected to in going in and out of our superheated living apartments, where an alternating temperature of sometimes as much as one hundred degrees' difference is experienced between in- and out-of-doors; and where the nasal mucosa in its attempt to adjust itself to such abuse becomes so thickened and hypertrophied as to close off normal ventilation and drainage of the surrounding, communicating sinuses.

The symptomatology of this non-suppurative mucoid affection, especially in the nose, being so meager as it is objectively, largely resolves itself into subjective complaints of the patient. Except in the presence of acute rhinitis or coryza, the patient's story of long, continuous, partial obstruction in his nose, alternating from one side to the other, spoken of by the older rhinologists as intumescent catarrh, should lead us to suspect early hyperplastic disease. And the "hay-fever" patient who has his "hay fever" at intervals the year round should be carefully considered likewise. The recurring water-logged nose of the so-called "vasomotor rhinitis" patient should also be thought of as having a possible hyperplastic or mucoid sinus at the bottom of his trouble.

Post-nasal dripping, so bitterly complained of by patients who, upon inspection, show no pus or recognizable secretion, is often described as an irritation that keeps them hawking and spitting and swallowing until their pharyngeal muscles cramp, which, though not recognizable even to them as pus or even mucopus, is nevertheless such an irritant to their soft palate and pharynx that in its path a scalding sensation is felt, as if a corrosive substance had trickled over these surfaces. The complaint of a watery drip from one nostril occasionally when stooping over, with or without an odor to the patient, which sometimes excoriates the outside skin, is a much less frequent story, but is occasionally heard.

Morning headaches, upon awakening, which are always noted by the observing patient as associated with the occurrence of transitory obstruction in one certain side of the nose, but which, nevertheless, occur independent of an acute rhinitis and without any sign of pus discharge, are likely the result of a mucoid sinus affection, and most likely of the maxillary. The midday headache of frontal sinus disease, without any sign of pus, and the occipito-nuchal headache of sphenoid disease, where repeated inspection fails to show any suppurative discharge, are also very likely of the mucoid type. And these patients frequently experience a startling and unannounced mucous coagulum of considerable size slipping into their nasopharynx, which, when in a recumbent position, brings them to their feet to expectorate it.

Whether the ultimate toxicity of mucoid sinus diseases is from bacterial toxins direct, or the subsequent chemical poisoning from retention and decomposition, I do not know, but it is generally believed that a parasite that will thrive in mucous secretion must be a rugged and hardy organism, for mucous is regarded, I believe, as bacteriocidal. At any rate, the systemic poisoning is most virulent, as seen in children especially, and, too, in adults.

I have particularly in mind a patient who, with trigeminal neuralgia (tic douloureux), had been in almost constant pain seizures for many days, and who was promptly relieved by the evacuation of a large mucous coagulum from the maxillary sinus of the side opposite her tic. She remained free of her trouble for seven months, when she again was relieved of the tic by evacuating a mucous coagulum the size of the white of an egg from the opposite maxillary antrum.

We have many records of patients whose low-grade arthritic symptoms have promptly ceased upon the relief afforded by antrum

windows and resultant ventilation and evacuation of mucoid accumulation.

I have a patient who, unaided, by snuffling and struggling as best he could, drew a mucous coaglum from some sinus on the right side of his nose which completely filled his mouth and, when expectorated into his cupped hand, filled it to overflowing, comparable in amount to the white of a large egg.

The prompt subsidence of systemic symptoms in children, where incision of the "dull, gray drum," followed by forceful suction, has evacuated the retained stringy mucoid mass, has been observed so many times in our experience that we feel ready to gamble on the result.

Cases of alleged hay fever and alleged vasomotor rhinitis, with definite asthmatic symptoms which are also fully relieved, so frequently get such entire relief by high septum resection, reaching to the roof from front to back, that we feel anxious to recommend it in all such cases where the crowding in the upper half of the nose is even but half of that for which in the early years of my practice I would have felt justified in recommending it.

Many times, in such crowded noses, one is astonished to find a "dog-ear-like" middle turbinate, with the bone of it entirely absorbed, and other evidences of end-results of hyperplastic process that ordinary inspection gave no hint of, including clusters of little bead-like polyps. The relief from headaches, as well as asthmatic symptoms, in these cases is usually surprising to patient and operator, and, what is most agreeable, resection of more than the submucous structures of the septum seems unnecessary, for with room and ventilation the rest clears up of itself.

No surgical procedure in rhinology, according to our experience, is capable of such a spread of beneficial application as high septum resection, reaching to the roof from front to back, in these diseased, crowded upper-half noses, where surprisingly much unseen pathology may be found after such resection, but which previously was not visible and could not be seen even with all possible shrinkage. Rarely does ethmoid or sphenoid disease exist without involving both, and the high septum resection proves equally beneficial to either and to both. The bony and cartilaginous septum may be as straight as a plumb line, with the lower half of the nose amply open, yet the upper portion of the septum be so thick and broad as to tightly wedge itself between the other structures. So long as this condition exists in these diseased noses, resolution, or even improvement, is impossible; nor is any other but most destructive surgical procedure possible.

To repeat what I stated before, the high septum resection alone is very often the only procedure necessary to get complete relief in these cases, where, without the loss of any mucous surfaces, it is, above all others, the operation of choice; especially since local (bloc) anesthesia is so perfect for its performance. Anything short of high resection, from front to back, of the upper half of the septum in these cases will not bring the desired result.

The treatment and handling of these mucoid affections, both in the nose and in the ear, we believe to be best met by conservative surgery. Exenteration usually has no place in its application to any of the involved structures (including even the ethmoids) unless it be in case of a mucoid-mastoid labyrinth, which generally has a history of long standing, non-painful involvement. Such a patient, following an acute, low-grade otitis media, with a leathery drum which does not rupture and has little and often no discharge after paracentesis except by forceful suction, fails to recuperate his well-being and continues hard of hearing in that ear. Aside from these, his sole complaint is that the side of his head feels dull, heavy and "woodeny." Occasional neuralgia-like, shooting pains are felt in the temporal region, and deep tenderness can be elicited upon firm pressure over the mastoid. Generally these mucoid mastoids show pathology of a most unexpected extent, almost unbelievable from the mildness of their symptoms, both objective and subjective.

The process limited strictly to the tympanic cavity, aside from the continued loss of hearing, gives the patient little concern after the onset, and will continue indefinitely for weeks without rupture and discharge, showing only a dull, leathery-looking drum. If the process is not recognized, and the drum is not incised, followed by forceful suction to evacuate the mucoid contents of the tympanum, the deafness will become permanent as a result of the hard, glue-like organization of the mucoid exu-

date, and the picture of extreme adhesive process will be complete.

This mucoid process in the frontal sinus, according to our experience, has been very hard to recognize. Cases that have the unmistakable midday pain of frontal sinus trouble, but do not show pus, are likely of the mucoid type, and we have opened frontal sinuses by external operation which have contained this same mucoid (not pus), egg-albumen-like material under pressure. Enlarging the normal passage from the frontal by judicious use of the rasp, if you are fortunate enough to have it remain free and open by postoperative care, is the only intra-nasal procedure available, and usually suffices, supplemented by proper suction, until ventilation accomplishes its benefits.

The ethmoids, if not altogether polypoid, in crowded upper noses so often do perfectly following high septum resections, which gives ample room, that we look for the most gratifying results as a routine.

The sphenoids, along with the posterior ethmoids, also do so well following high septum resection to its posterior limit that opening the face of the sphenoid is not done until we observe the results of the former simple procedure.

The antra of the maxillaries are usually adequately taken care of by large windows under the inferior turbinates, after the anterior end is nipped at its attachment to the side wall and is moderatey hinged upward. The window should be as low as possible, but this is hard of accomplishment owing to the ruggedness of the ridge at the floor of the side wall; and even if lowered to the utmost is not low enough to get away from the rather deep catch-basin form of the antral floors, which hold such considerable residual quantity of discharge.

Irrigation, in these mucoid sinus affections, according to my belief and experience, is only an added liability, for in case of the antra and sphenoids the irrigation water only adds to and favors absorption of the residual mucilaginous secretion, which is contrariwise to the most advantageous state of the cavities for resolution and recovery, unless it be completely removed subsequently and these catch basins be left dry, which is very difficult of accomplishment. A water-soaked sinus mucous membrane only adds to the difficulty and is least favorable to resolution.

Suction properly carried out, it seems to me, is a most beneficial and effective therapeutic supplementary procedure after providing ample drainage and liberal ventilation, for in the beginning it is the shutting off of these very essentials that leads to the pathology under consideration.

Suction as ordinarily administered in our offices is most inadequate for the best results. The cannula, directly placed by the operator into just the place where he wishes to use suction, is, of course, not what I mean. But suction as usually and generally attempted at the nostril entrance, and which causes negative pressure in all the nasal cavities on both sides with the pulling-up of the soft palate, needs to be continued much longer than we give time to such procedure in our offices.

It is our habit to instruct the patient how it is accomplished with the ordinary water pump, which he can purchase inexpensively and attach to the water faucet at home. In this way he can continue its use for half-hour periods once or twice daily after drainage and ventilation have been provided for surgically. Suction under the patient's own control is less painful and alarming to him, and far more effective when used for longer periods of time than we ourselves would devote to it in the office; and, in addition, the passive hyperemia that he gets in the diseased sinus from such lengthened treatments is very beneficial, even if the evacuation of the cavities is accomplished in less time than the period during which he continues the suction. And it is a job that we are very happy to relinquish to anyone who can do it as well or better than we can do it in the office.

As in the comparatively recent past the blanket diagnosis of syphilis for much ophthalmological pathology has given way before our understanding of focal infection, and, too, in like manner, rheumatism has been wiped from the board, the ever-decreasing designation of cases as hay fever, vasomotor rhinitis, and so on, will, I believe, be very much thinned down by our recognition and full appreciation of non-suppurative mucoid nasal and aural disease.

CASE REPORTS

POISONING FROM CINCHOPHEN*

LEDA J. STACY, M.D.
Division of Medicine, The Mayo Clinic
and
FRANCES R. VANZANT, M.D.
Fellow in Medicine, The Mayo Foundation
Rochester, Minnesota

A married woman, aged fifty-two years, presented herself at The Mayo Clinic in December, 1929, on account of intense jaundice of one week's duration. She had been seen first at the clinic in August, 1922, with a history of menorrhagia and intermenstrual bleeding for two or three years, and pelvic pain for several months. Examination disclosed moderate hypertension, and an epithelioma of the cervix of the uterus which extended onto the posterior vaginal wall. The fundus was large, firm and tender. A specimen taken from the tumor was diagnosed as squamous cell epithelioma, graded 3 according to Broders' classification. Radium treatments were given and a total of 3,500 milligrams hours was used in five doses at intervals of a few days. Because of very severe inflammatory reaction in the pelvis, treatment was discontinued. Subsequently the reaction subsided, the vaginal discharge and bleeding stopped, and the patient's health seemed excellent.

The patient returned to the clinic eight months later for observation. She felt well, and examination revealed nothing of significance save moderate hypertension. There was no evidence of any local activity of the malignant condition and the uterus was still large, but soft, with apparent fixation in the right side of the pelvis. She returned again in December, 1928, for examination. The vault of the vagina was sealed off and smooth. The uterus was still about two and one-half times the usual size, and movable. The hypertension had increased and the patient weighed 205 pounds.

From 1923 to 1929 the patient had enjoyed excellent health. During the summer of 1929 she had suffered with neuritic pains in the right thigh, over the course and distribution of the sciatic nerve. Because a friend had found cinchophen effective in relieving pain, the patient had started taking the drug and for six weeks she had taken one to three tablets of cinchophen daily. She finally had discontinued the medicine because of the appearance of nausea and vomiting which had developed a month after she had begun to take the drug. A week after she had stopped taking cinchophen, jaundice had appeared suddenly, concomitantly with an attack of diarrhea which had lasted only a day. The jaundice had been intense from the beginning and had not fluctuated. There had been no purpura or pruritus. Her home physician referred her to the clinic. He had found that her liver was enlarged but that it was smooth, not nodular.

The patient's skin and sclerotics were bright orange-yellow. Her nutrition was good and she felt well except for nausea. The systolic blood pressure in millimeters of mercury was 200; the diastolic, 110. The liver was just palpable on deep inspiration and in the course of the next few days it rapidly became smaller. Subsequently, it could not be felt. The spleen was slightly enlarged. The vault of the vagina was sealed off by dense scar tissue. The uterus seemed a little large, but was freely movable. There was slight infiltration of the broad ligaments. The neuritis had disappeared; there had been no pain since the beginning of the jaundice.

The concentration of hemoglobin was 72 per cent. Erythrocytes numbered 4,600,000, leukocytes 11,000, and platelets 120,000 in each cubic millimeter of blood. The urine contained a trace of albumin, a faint trace of a reducing substance, granular casts, and thirty-six leukocytes to the low power field. The concentration of blood urea was found to be 48 mg. in each 100 c.c. and that of the blood sugar, 87 mg. The coagulation time, as determined by the Lee method, was at first normal, but later was prolonged to twelve minutes. The van den Bergh reaction in the serum was direct, and the concentration of serum bilirubin, 39 mg. in each 100 c.c. Bile was not found in the stools, and repeated duodenal drainage failed to recover more than the faintest possible trace of color in the duodenal contents.

The patient was given a diet high in carbohydrate, calcium lactate in large doses by mouth, calcium chloride, and solution of glucose intravenously, both with and without insulin, but her condition grew steadily worse. The level of the serum bilirubin remained constant, the area of hepatic dulness as determined by percussion became smaller daily and she soon became drowsy and unresponsive, rapidly sinking into a typical state of hepatic coma on the fourth day after admission. She died on the ninth day, sixteen days after the onset of the jaundice, with terminal hyperpyrexia and signs of bronchopneumonia.

At necropsy, the liver was found to weigh only 903 gm., and it showed the typical gross and microscopic picture of acute yellow atrophy. There were small, petechial hemorrhages on the mitral valves, pleura, and mucous membranes of the stomach and jejunum, and there was evidence of terminal bronchopneumonia. Malignancy was not found on section of the uterus, cervix or vagina, but there was an increase in the fibrous connective tissue, compatible with the usual

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

after-results of radium irradiation. There was a small, irregular mass in the right broad ligament, involving the right ovary, which had completely obstructed the ureter and produced right hydronephrosis. Section of the ovary revealed a hyaline necrotic mass, with regions of calcification, occasional epithelial pearls, and a few mitotic figures. However, in that portion of the mass nearest the pelvic wall, there were many mitotic figures, indicating active malignancy.

COMMENT

The case is of interest in part from the standpoint of control of malignancy with radium. Although the cervical epithelioma was considered inoperable when the patient was first seen, and she received considerably less than the usual initial dose of radium, she remained free of symptoms for almost seven years. The pain which then developed suggested pressure on the sciatic nerve, although bimanual pelvic examination failed to demonstrate infiltration in the broad ligament or enlarged iliac lymph nodes. At postmortem examination it was noted that the portion of the mass which occupied the position of the right ovary contained cells which microscopically appeared to be of low grade activity whereas the portion furthest removed from the site of the original growth and from the radiated area was made up of cells of extremely malignant appearance.

In more recent years, it has been our custom to give deep roentgen-ray treatments once every three months for at least a year following the initial radium treatment in order, if possible, to destroy the outlying carcinomatous cells which might later became reactivated, as they seem to have done in this case.

The fatal outcome in this case was related to the recurring malignant condition in that the pain which it produced occasioned the taking of cinchophen, which caused the fatal intoxication. The drug can be readily obtained without prescription. The patient continued to use it freely for at least two weeks after definite toxic symptoms had appeared. Stopping the taking of the drug in no way checked the rapidly developing hepatic atrophy. The course of the illness is typical of the course in the fulminating type of yellow atrophy of the liver. The clinical picture is usually that of a rapidly progressive, painless jaundice with gastro-intestinal symptoms of which nausea and vomiting are the most common. In fatal cases, the patients sink into a terminal comatose state after an average of about two weeks, whereas if patients recover, icterus may persist for six weeks to two months.

The destructive process unquestionably continues for many weeks after the drug is completely eliminated from the body. Therefore, while it is important to stop the drug immediately on the appearance of any toxic symptoms, prompt recovery should not be expected in every case.

In the absence of any specific treatment, general supportive and symptomatic measures should be utilized. Since it has been shown repeatedly that an abundant supply of carbohydrates protects the liver from such poisons as chloroform and phosphorus and accelerates recovery from the hepatic injury induced by these poisons, it is rational to force the intake of carbohydrates by mouth, by proctoclysis and by vein. According to Minot and Cutler's work, calcium likewise has a protective action for the liver. Given by mouth or intravenously its use seems logical, and certainly does no harm. It must be admitted, however, that the measures now employed in the treatment of cases of acute yellow atrophy are most inadequate and apparently influence the outcome very little.

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SODIUM AMYTAL IN CESAREAN SECTION

REPORT OF CASE

J. R. Sturre, M.D.
Minneapolis

Sodium amytal has been previously used in cesarean section. In reviewing the literature I find that Mendenhall[1] reports an hysterotomy on a woman in toxemia with convulsions, with a dead six months fetus.

In another report, Mendenhall mentions that several cesarean sections have been done. However, he does not go into detail in these reports on the effects of sodium amytal on the fetus. His first report deals with a dead fetus, so that, in this respect, this hysterotomy can be considered a laparotomy.

There has been much controversy locally on the effect of sodium amytal on the fetus, when used in obstetrics. It is claimed by some that the babies are depressed and hard to resuscitate. Believing that sodium amytal could be safely administered to a pregnant woman without injury to her fetus I employed this drug in the following case.

This woman, aged 22, a twin and a primipara, weighed ninety-eight pounds when first seen in the second month of her pregnancy. Her pregnancy was normal in every way throughout.

Her physical examination was normal except for her pelvic measurements.

Her family history was negative. Her twin sister is living and well.

Pelvic measurements: Int. Sp. 23—Int. Cr. 25—Ext. Conj. 17—Int. Conj. 8—Bi. T. short 7—Ant. Sag. 7—Post. Sag. 8. Baby estimated at eight pounds. The patient's weight at term was 132 pounds.

Labor began at term at 8 p. m., Feb. 4, 1930. She entered the Midway Hospital in St. Paul at 3:30 a. m. Feb. 5, 1930. Contractions were regular and severe, occurring every few minutes. She had an acute cold and was coughing considerably. Rectal examination was made at this time and the cervix was found to be dilated to a breadth of two fingers and the head not engaged.

At 4:30 a. m., one hour later, the findings were still the same. At this time 1 Gm. of sodium amytal was

dissolved in 10 c.c. of distilled water and 7.5 c.c. were given intravenously. She went to sleep immediately. Her pains continued regularly and at 5:30 a. m., one hour after the administration of the sodium amytal, she was sent to surgery for cesarean section. Here I picked up her skin on the abdomen with an Allis forceps and closed them to the second catch on the instrument and made traction on the skin. There was no evidence of sensation.

A very small amount of nitrous oxide was given with 60 per cent oxygen. The cesarean was completed in twenty-two minutes.

On incising the uterus, a small uterine incision was made. Through this the baby immediately presented an arm by its own muscular action. I placed this arm back into the uterus and, inserting my hand, grasped a foot and extracted the baby by version. The child was very active and cried immediately as the head was brought out. The thighs had to be held out of the way as the cord was clamped because of the baby's active movements. The color of the child was pink. There was absolutely no depression in any manner and no respiratory embarrassment at this time or later. The baby weighed exactly eight pounds.

The mother's uterus contracted at once and bleeding was not more than moderate.

In reporting this case I am not attempting to prove anything. However, because I can find no similar case that has been reported in full giving the effect of this drug on the child, I am making this report. In my case the drug was given over an hour before operation was begun. This gave time for maximum absorption of the drug by the baby and not sufficient time for recovery on the baby's part from any depression which might have resulted.

Nitrous oxide was not necessary but was given to insure that the patient would not rouse enough to interfere with the operation. However, the anesthetist said she did not give her enough nitrous oxide to make her dizzy.

Oxygen was given for obvious reasons.

Assistance was rendered by other members of the surgical team, consisting of Dr. N. P. Bentley, first assistant; Dr. A. M. Smith, second assistant (interne); and Miss Helen Cook, R.N., anesthetist.

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EFFECTS OF CINCHOPHEN

Purpuric, urticarial, or scarlatiniform eruptions have been reported by many observers following the administration of cinchophen. They may occur with or without edema. Gastro-intestinal disturbances, from epigastric discomfort to acid eructations and heartburn, are the commonest expression of intolerance to cinchophen. These may be avoided by the giving of an abundance of water with the drug, and 1 Gm. of sodium bicarbonate, though the latter should be given separately and not mixed with the drug. By using neocinchophen, one may avoid usually the symptoms of gastric irritation. Sometimes cardiovascular disturbances have been noted. By far the most serious results of cinchophen intoxication result from injury to the liver, which may even go on to a fatal acute yellow atrophy. (Jour. A. M. A., January 25, 1930, p. 283.)

QUICAMPHOL (TRANSPULMIN) NOT ACCEPTABLE FOR N. N. R.

In 1927 the Council on Pharmacy and Chemistry considered Transpulmin, offered by the Chemisch-Pharmazeutische A.-G., Bad Homburg, Germany, "for the painless parenteral quinine-therapy in inflammatory affections of the lower air passages." The Council found the preparation unacceptable and submitted its findings to the German firm. The firm adopted the name Quicamphol for the preparation and took other measures in an effort to make the product acceptable. Quicamphol is now sold in the United States by Spicer and Company, which firm offers it "for intramuscular injection in bronchitis, pneumonia, and pulmonary infections generally." The Council declared Quicamphol (Transpulmin) unacceptable for New and Non-official Remedies because the claims for the value of the preparation in the treatment of lobar pneumonia, influenza, etc., are unsupported by satisfactory clinical evidence (Jour. A. M. A., November 9, 1929, p. 1471.)

President's Letter

THE organization of men into groups for their mutual protection or gain dates back into very ancient times. Organized activities have varied with changing conditions and advancing civilization but the underlying principles animating all social organizations have remained unchanged, because human nature remains basically the same today as it was in the beginning.

The congestion of peoples into great populations of both rural and urban types, the growth of industrialism, the expansion of knowledge, the figurative contraction of distances by virtue of our modern means of quick communication, have given rise to tremendous social problems which are challenging us for solution.

Society is striving to understand the conditions in which it finds itself, is courageously attempting to untangle the maze of conflicts, is seeking to find the way to establish social, industrial and economic justice. Manifestly society as a whole cannot act intelligently on each of the great multiplicity of problems to be considered, therefore quite naturally groups with common interests have formed themselves into organizations for the purpose of studying their own needs, their relations to other groups, their position in relation to society as a whole, the best means of serving themselves, each other and that which they themselves compose—the public.

Thus we have financial organizations, labor organizations, industrial and agricultural groups, social welfare, child welfare, lay health bodies and what not. It is small wonder that in the earnestness of their activities they cross paths or seem to, and often find themselves in conflict with each other.

The professional and scientific bodies have been the playthings of the other groups to a very considerable extent. This fact has touched the medical profession more directly, perhaps, than it has the others. The old austere spirit of professional aloofness has long held sway within our ranks. Even yet there are many of us who feel that it is beneath our dignity to enter into active solution of medical economic problems, except as individuals. However, the field men of medicine, they who are at the bedsides of the sick and injured, while accepting themselves as men of science, none the less realize that they earn their living by caring for the sick. Their professional spirit gives them primal interest in helping their patients. Their pecuniary interest is secondary. The professional spirit cries out for untrammeled scientific freedom. The spirit born of ancestral independence of action likewise cries for freedom. It instinctively rises rebelliously against economic thraldom.

Our purely scientific organizations found it necessary to add to their activities a phase which we are pleased to call medical economics. This field has broadened until we now find that the Minnesota State Medical Association has at least eleven committees engaged in studying our problems in relation to the public, to various technical services, to exogenous groups of healers, to the procedures of the Department of Public Health, to public health education and to other closely related matters.

The great swing and scope of education got under way while we slept, so to speak, or worshipped at the shrine of science, wholly unmindful of what was happening. Suddenly we began to realize that the medical profession was losing its one time position of honor and prestige. Because of our self centered and narrow attitude we were relinquishing our function as public educators and to just that extent failing in our professional duty. Whereas a generation ago the doctor worked as an individual, was professional advisor, political counsellor, general all around sage and burden bearer, now the scenes had changed and collectivism had come to be the mode of action. Soon we found an impatient public was carrying on its own system of health propaganda and education. Evidently if we were not going to do it the public would do it themselves, though not always to their best advantage but certainly to our disadvantage.

Then we woke up! The result has been one of splendid accomplishment. Today we have an aroused profession, aroused to its public responsibility, working organically as a unit. It is taking the lead as an organized body in all of the many movements in which medical lore can be of service. It no longer stands idly by while its larger work is being mismanaged by others. It is guiding, wisely directing, helping. It is thrusting aside the ill informed, less than half trained, self seeking group who had the pretensions to teach the laity. Such were accepted for a time on many occasions by lay organizations, but only because we ourselves were not available.

Organization has redeemed our honor. We should rejoice. But organization and the work it entails which devolves upon us is costly. That is why state society dues have been raised. That is why, having placed our shoulders to the wheel, we must keep them there, lest we step back into the quagmire of dishonor.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

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POISONING FROM CINCHOPHEN

When cinchophen was first introduced to the medical profession in 1908, it was advocated as a specific analgesic in gout. For many years its use was restricted to gout and conditions thought to be of gouty origin. Gradually, as it became apparent that its power to relieve pain was not specific, it was prescribed in other conditions, and has been widely used in all sorts of painful affections, not only by the medical profession but by the public at large and even in proprietary and patent medicine mixtures.

Partly because of its restricted administration in the first decade of its use, it was considered to be relatively innocuous and safe when given in large doses over long periods of time. But in 1922, Schroeder reported seventeen cases in which various toxic manifestations had followed the ingestion of cinchophen. Since that time, many reports of toxic effects from cinchophen have appeared, with gradually increasing frequency. These effects have varied from urticaria, and toxic cutaneous rashes, to gastro-intestinal disturbances and serious hepatic toxemia, frequently terminating in yellow atrophy and death. In August, 1929, Reichle reviewed forty-seven case reports which had appeared in the literature. Eleven of the patients had died of toxic jaundice. At The Mayo Clinic, four patients who had taken cinchophen or derivatives of cinchophen at home have died from disorders definitely attributable to the drug; two others, with icterus of moderate severity, ultimately recovered after discontinuing the drug. Because of our experience with these cases, we now make careful inquiry concerning previous ingestion of drugs of all patients who present themselves with jaundice, especially in cases in which the jaundice is from intrahepatic causes. If this inquiry is always made the diagnosis of intoxication from cinchophen will be made more frequently. Since the pathologic picture in these cases differs in no way from that of the idiopathic form of acute yellow atrophy, in order to make the diagnosis it is necessary to correlate the pathologic data with the clinical history, especially as it pertains to previous medication.

Apparently it is not recognized generally that cinchophen is a dangerous remedy. In large part this may be due to the fact that most of the cases reported have been published in journals which do not have wide circulation in this country. That some of the manufacturers of the remedy appreciate its toxic potentialities is evident by the cautions which accompany packages of their preparation, advising that the drug be discontinued immediately if any gastro-intestinal symptoms occur. Unfortunately, however, after gastro-intestinal symptoms have manifested themselves, the injury has been done, and stopping the drug often is ineffective in checking the

progress of the toxemia. In fact the first symptoms have been known to appear even after the medication has been stopped.

There appears to be marked variation in individual susceptibility to cinchophen. One man seen at The Mayo Clinic had taken it almost daily for thirteen years without any ill effects, whereas in another patient pruritus developed after the first dose. The latter patient continued to take the drug and subsequently died of subacute yellow atrophy. In another instance the preparation was administered for more than six months before gradually developing jaundice appeared; the jaundice subsided after medication had been stopped.

It has been thought that impurities in the product might be responsible for the toxic properties rather than the drug itself. In the case of poisoning from cinchophen reported in this issue by Stacy and Vanzant, the preparation used was of the highest quality. A conjecture also has been advanced that those people who are sensitive to cinchophen break down the molecule in some abnormal way, producing toxic products. This has not been proved but the subject is being investigated under a grant from the American Medical Association at the present time.

Cinchophen often has been administered interchangeably with the salicylates, but by the use of cinchophen the patients are unnecessarily subjected to risk. As this becomes better known among the members of the profession, undoubtedly cinchophen will be prescribed less; other and safer analgesic drugs will be given preference. Meanwhile, however, pharmacists will continue to sell directly to the public countless packages of a dangerous drug, and patent medicines containing this drug still will be compounded. This uncontrolled sale should be regulated either by legislation, or by publicity, or by both.

L. G. Rowntree, M.D.

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YALE'S INSTITUTE OF HUMAN RELATIONS

The mere announcement that Yale University is establishing an Institute of Human Relations sounds as fantastic and presumptuous as the proposal of H. G. Wells to write a History of the World. And yet Mr. Wells did it and it looks as though the few remaining millions necessary to round out the building and endowment program of the so-called Human Welfare Group will be forthcoming. This group will consist of the Yale Medical School, the Yale School of Nursing, the New Haven General Hospital and Dispensary, and this so-called Institute of Human Relations, the whole representing an investment of some thirty-five million dollars.

This old world is not doing as well as it should. Phenomenal progress has been made in recent years along material lines. Science has done wonders through inventions which have substituted the machine for man power, has greatly speeded up transportation by land, sea and air and has made the individual a world citizen through inventions which have facilitated world-wide communication. And yet there is serious question whether the human being is any nearer the goal of real happiness than he was before all this scientific and material progress was achieved. Medical science has lengthened life expectancy and has reduced the prevalence of disease as a whole, but that remnant of barbarism—war—has not been outlawed. Suicide is on the increase. Poverty and unemployment in spite of great national wealth is still with us. Law violation has shown a tremendous increase in recent years. Hospitals for the insane and institutions for the feeble minded are full to overflowing.

Many agencies, religious, moral, social, governmental, medical, etc., are working along their respective lines in an effort to better human conditions. But there has been a surprising lack of correlation of these various activities. This correlation is what the Institute of Human Relations is going to attempt. The Institute in addition to being closely associated with the medical activities of Yale University will also be affiliated with the divinity and law

schools, and the departments of psychology and sociology. Thus all university activities which have to do with man's mental, physical and social welfare will be brought together to some extent under the one roof of the Institute. Research will be an important part of the Institute's work. Members of the graduate schools of medicine, law and divinity will also have the benefit of instruction in other matters bearing on human welfare than their own.

There are certain subjects which might well be added or substituted if need be in undergraduate medical instruction of today, to advantage. As a result of present-day medical training it is only too easy for the young physician to see only the physical side of the patient and to forget that his mental attitude, family and financial worries may play an important part in his complaint. We can see a distinct advantage in undergraduate instruction in psychology and sociology in furnishing the young physician of today with that something so valuable in the handling of patients which the family doctor of yesterday possessed in such large measure.

Such a praiseworthy attempt to evolve some solution for some of the tremendous social problems of today merits the support of serious minded capitalists. That the Institute of Human Relations has obtained the generous support of such individuals as well as grants from the Rockefeller Foundation, the General Education Board and the Commonwealth Fund, is evidence of the sense of custodianship alive in at least some of our wealthy citizens. The results of this undertaking which seems almost in the nature of an experiment, will be awaited with considerable interest by medical men especially.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

STATE OF MINNESOTA VS. BOYD T. WILLIAMS

Above defendant, who has been conducting a cancer sanatorium in Minneapolis, and who was convicted by a jury of practicing healing without a basic science certificate, paid a fine of $250.00 to the Clerk of the District Court of Hennepin County on Monday, March 24, 1930. Following the defendant's conviction, a stay of execution of sentence was granted to enable Williams to appeal his case to the Supreme Court. However, the plans for perfecting the appeal were abandoned upon the payment of the fine.

COMMUNICATION

AMERICAN MEDICAL ASSOCIATION

October 25, 1929.

Dr. E. A. Meyerding, Secretary,
Minnesota State Medical Association,
11 W. Summit Ave.,
St. Paul, Minnesota.

Dear Dr. Meyerding:

Your letter of October 22, regarding the Midwest Company, has been referred to me.

The Midwest Company is a trade style used by Mr. James C. Fifield and his wife, in partnership. It is the intention of Mr. Fifield to get up a so-called biographical directory of American physicians and surgeons, comparable in its field to the book that Mr. Fifield issues—"The American Bar"—having a legal field.

"The American Bar" is a reputable publication that is held in fairly high esteem by men in the legal profession. The book comprises brief biographical sketches of various members of the American bar, the sketches being even less detailed than those that appear in "Who's Who." So far as we have been able to learn, there is no commercial taint to this book. The book itself, we might state, sells for $30.00 a volume.

Mr. Fifield seems to be thoroughly reliable and honest and gives every evidence of wanting to make his proposed "American Physicians and Surgeons" just as reliable a publication as "The American Bar."

The method to be used by Mr. Fifield and his agents in determining the eligibility of individual physicians and surgeons for inclusion in his proposed book is that of taking the names of Fellows of the American Medical Association, of the American College of Surgeons and of the American College of Physicians, and have his representatives call on them. We understand that each physician called on has submitted to him a certain number of names of the other eligible group in the same locality, and the physician is asked whether, in his opinion, such men should be eligible to inclusion in the proposed book.

Mr. Fifield is also considering soliciting advertisements for the proposed directory. He tells us, in a letter received recently, written in answer to some specific questions we put to him on the point, that his plan is to confine his advertising to such advertisers as are accepted by the publications of the American Medical Association.

He tells us, further, that his representatives, who are calling on doctors, are at the same time attempting to secure orders for the book. As we see it, there can be no serious objection to this plan, provided, as we have said to Mr. Fifield, it is made quite plain to the physicians that a subscription is not, in any sense of the word, a *sine qua non* for eligibility to the book.

Very sincerely yours,

ARTHUR J. CRAMP.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

That the medical profession is already in partnership with the profession of public health in the field of health education is clearly indicated in this interesting survey of the membership of the leading health and medical associations of the country and the programs of two of their recent biggest meetings. The survey was just completed by Dr. R. O. Beard for the information of the public health education committee of the Minnesota State Medical Association.

It shows that a large army of public health workers neither practice medicine nor hold an M.D. degree. Among them are public health teachers, sanitary engineers, sanitary chemists, psychologists, sociologists and public health nurses.

Such persons as these are sharing control of the profession of public health with the medical profession. Their qualifications for the work are as substantial and important, in the opinion of Dr. Beard himself, as those of the medical profession, many of whom are not, themselves, qualified for public health work.

At any rate, it is entirely fitting, in his opinion, that both should grow together side by side, sharing equally in the great cause of health education for the public at large.

Dr. Beard's report follows:

RESULTS OF STUDY OF HEALTH AND MEDICAL ASSOCIATIONS

The Membership of The American Public Health Association of 1929 consists of:

(a) Those who by education, experience, interest and appointment are exclusively engaged in public health work, and who do not hold the Degree of M.D., in the proportion of ..... 52 per cent

(b) Those who hold the Degree of M.D., but are exclusively engaged in public health work, in the proportion of ..... 18 per cent

(c) Those who hold the Degree of M.D., and who are practitioners of medicine, but are interested in, and more or less employed in, public health service to the proportion of ..... 30 per cent

Total ..... 100 per cent

The membership of the American Child Health Association of 1929 consists of:

(a) Those who by education, experience, interest and appointment are exclusively engaged in public health work, and who do not hold the Degree of M.D., in the proportion of ..... 58 per cent

(b) Those who hold the Degree of M.D., but are exlusively engaged in public health work, in the proportion of ..... 24 per cent

(c) Those who hold the Degree of M.D., and are practitioners of medicine, but are interested in, and more or less employed in, public health service in the proportion of ..... 18 per cent

Total ..... 100 per cent

The 1929 program of the American Public Health Association and related public health organizations, meeting in Minneapolis, offered addresses, articles or papers to the number of 185

Of these, the number contributed by public health workers, without medical degrees, was ..... 132, or 71.3%

The number contributed by writers holding the Degree of M.D., but engaged exclusively in public health work, was ..... 33, or 17.9%

The number contributed by writers holding the Degree of M.D., which were of combined medical and public health interest was ..... 20, or 10.8%

The 1928 program of the American Medical Association, meeting in Minneapolis, offered addresses, articles or papers to the number of 296

Of these, the number contributed by practitioners of medicine and bearing upon the causes, diagnosis or treatment of disease were ..... 261, or 88 %

While the number contributed by Doctors of Medicine and devoted to the discussion of topics related to preventive medicine, public health, and public health education were ..... 25, or 12 %

The 1930 program of the American College of Physicians, meeting in Minneapolis, offered addresses, articles or papers to the number of 245

Of these, the number contributed by practitioners of medicine, and bearing upon the causes, diagnosis or treatment of disease was ..... 231, or 94 %

While the number contributed by Doctors of Medicine and devoted to the discussion of topics related to preventive medicine, public health or public health education were ..... 15, or 6 %

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of May will be as follows:

May 7—Your Hospital
May 14—Blue Ribbon Children
May 21—Cirrhosis of the Liver
May 28—Cause of Headache

MINNESOTA RADIOLOGICAL SOCIETY

The Minnesota Radiological Society, a new organization for the study and advancement of radiology, held its first formal meeting at the Mayo Clinic, Rochester, Minnesota, on March 1, 1930. The following program, prepared by Dr. B. R. Kirklin, was presented.

1. "Roentgenologic Manifestations of Malignant Disease in the Colon," Dr. H. M. Weber.
2. "Gastro-Jejunal Ulcer," Dr. J. D. Camp.
3. "X-ray Studies on Tuberculous Spine and Shoulder in Children," Dr. R. K. Ghormley.
4. "Mediastinal Empyema," Dr. Jacob Sagel.
5. "Roentgen Diagnosis of Small Pleural Effusions," L. G. Rigler.
6. "Specific Radio Sensitiveness of Cells and its Significance to Radio Therapy," Dr. A. U. Desjardins.
7. "A Radium Technique in the Treatment of Carcinoma of the Cervix Uteri," Dr. R. E. Fricke.
8. "Results Obtained from Irradiation Therapy in Cases of Carcinoma of the Cervix Uteri," Dr. H. H. Bowing.

A banquet was held that evening at which the following addresses were given:

"Use of Iodized Oil in Gynecological Diagnosis," Dr. L. M. Randall.

"Preliminary Report of Intravenous Urography by Means of Uroselektan," Dr. C. G. Sutherland and Dr. W. F. Braasch.

The next meeting will be held in Duluth, Minnesota, in connection with the meeting of the Minnesota State Medical Association, in July.

KIDNEY SYMPOSIUM

A symposium on the kidney in health and disease will be held at the University Medical School, Minneapolis, July 7 to 18, 1930. Various phases of a limited part of the field of internal medicine will be presented by a number of physicians whose names are familiar to medical men both in this country and abroad.

Physicians are invited to attend the meeting, registration for which will take place at 9 A. M., Monday, July 7, at the Eustis entrance of the University Hospital. There will be no registration fee. Registration may be made in advance to Dr. Hilding Berglund, University Hospital, Minneapolis. Dormitory accommodations will be available to those who register before June 1.

The program includes the following:

Dr. A. J. Carlson, University of Chicago
Dr. G. Carl Huber, University of Michigan
Dr. E. K. Marshall, Johns Hopkins Medical School
Dr. R. E. Scammon, University of Minnesota
Dr. C. M. Jackson, University of Minnesota
Prof. F. Volhard, Frankfort-on-the-Main
Dr. A. N. Richards, University of Pennsylvania
Dr. E. T. Bell, University of Minnesota
Dr. R. N. Bieter, University of Minnesota
Dr. H. L. White, Washington University, St. Louis
Dr. W. F. Longcope, Johns Hopkins Hospital
Dr. Paul B. Rehberg, University of Copenhagen
Dr. L. G. Rowntree, Rochester, Minnesota
Dr. H. Berglund, Rochester, Minnesota
Dr. A. D. Hirschfelder, Rochester, Minnesota
Dr. L. Leiter, University of Chicago
Dr. R. A. Gortner, University of Minnesota
Dr. Harold Diehl, University of Minnesota
Dr. McN. Wetherby, University of Minnesota
Dr. H. P. Wagener, Rochester, Minnesota
Dr. G. E. Fahr, University of Minnesota
Dr. N. M. Keith, Rochester, Minnesota

The program will consist of morning and afternoon sessions.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

The next meeting of the Society of Internal Medicine will be held at Duluth, Monday, May 26, 1930.

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the Minnesota State Medical Association will be held in Duluth, July 14, 15 and 16, 1930.

Addresses will be given by the following:

Dr. Karl Meyer, Associate Professor of Surgery, Northwestern University
Dr. Ludwig Hektoen, Chicago
Dr. W. J. Mayo, Rochester
Dr. Ralph Kinsella, Professor of Internal Medicine, St. Louis University
Dr. E. C. Davidson, Detroit
Dr. R. S. Dixon, Detroit

Symposia on Traumatic Surgery, Carcinoma, Rheumatic Fever, Anesthesia, Therapy, and Our State Institutions, have been arranged.

Dr. Olin West, secretary of the American Medical Association, J. G. Crownhart, secretary of the Wisconsin State Medical Association, and W. J. Burns, secretary of the Wayne County Medical Society of Detroit, will speak at the Medical Economics meeting.

The Duluth profession is making extensive prepara-

tions for the meeting. All committees are appointed, President S. H. Boyer reports, and they are already working together under the general chairmanship of W. A. Coventry.

Following are other committee heads recently appointed: C. H. Scherer, banquet and entertainment; L. R. Gowan, civic clubs; E. Z. Shapiro, publicity; L. A. Barney, convention halls; J. F. Lepak, exhibits; C. L. Haney, reception; Gordon McRae, reunions and luncheons; B. F. Davis, hotel accommodations, and R. A. Nelson, sports. F. H. Magney and P. F. Eckman are vice-chairman and secretary, respectively, of the general committee.

One medical man remarked that he was attending the meeting for no other reason than to learn something about what his patients pay him for. He hoped other programs would imitate the state meeting and include more therapy for a change, he said.

Hotel reservations for members should be made through Dr. Ben F. Davis, 25 North Tenth Avenue East, Duluth, Minnesota.

AMERICAN COLLEGE OF PHYSICIANS

FIFTEENTH ANNUAL CLINICAL SESSION

The American College of Physicians will hold its Fifteenth Annual Clinical Session at Baltimore, Maryland, from March 23 to 27, inclusive, 1931. The Lord Baltimore Hotel will be headquarters.

Dr. Sydney R. Miller, Baltimore, as President, will have charge of the selection of the general scientific program. Dr. Maurice C. Pincoffs, of Baltimore, has been appointed by the Board of Regents as the General Chairman of the Session, and will make all local arrangements, including the making up of the program of clinics. Business details will be handled by the Executive Secretary, Mr. E. R. Loveland, from the College headquarters, 133-135 S. 36th Street, Philadelphia, Pa.

The attention of secretaries of various societies is called to the above dates, in the hope that their societies will select non-conflicting dates for their 1931 meetings.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

The Stearns Benton County Medical Society met at St. Cloud, Minn., April 17, 1930.

The program consisted of the following papers: "Medical Economics," H. L. Gorneflo, St. Cloud; "Medical Legislation," Dr. Savage, St. Paul; "Public Health," Dr. G. Earl, St. Paul.

Motion that endorsement of present $15.00 state dues be continued was passed.

Election of officers resulted as follows: E. M. Kingsbury, Clearwater, President; H. B. Clarke, St. Cloud, Vice President; F. J. Schatz, St. Cloud, Treasurer; P. E. Stangl, St. Cloud, Secretary; R. N. Jones, St. Cloud, Censor; Delegate to State, C. B. Lewis, St. Cloud; Alternate, Geo. Sherwood, Kimball.

P. E. STANGL, *Secretary.*

WOMAN'S AUXILIARY
Minnesota State Medical Association

Minnesota County Medical Auxiliaries and Their Presidents

Blue Earth County—Mrs. A. A. Passer, Olivia, Minnesota.
Camp Release Co.—Mrs. J. S. Holbrook, 419 South Broad Street, Mankato, Minnesota.
Hennepin County—Mrs. James Blake, Hopkins, Minnesota.
McLeod County—Mrs. Thos. Trutna, Silver Lake, Minnesota.
Park Region—Mrs. W. W. Draught, Fergus Falls, Minnesota.
Ramsey County—Mrs. E. M. Hammes, 1456 Summit Avenue, St. Paul, Minnesota.
Red River Valley—Mrs. H. Froehlick, Thief River Falls, Minnesota.
Rice County—Mrs. Joseph Moses, Northfield, Minnesota.
Stearns-Benton—Mrs. W. B. Richards, St. Cloud, Minnesota.
St. Louis County—Mrs. F. W. Spicer, 1631 East Fifth Street, Duluth, Minnesota.
Washington—Mrs. O. B. Freligh, Stillwater, Minnesota
West Central—Mrs. C. Frank Ewing, Wheaton, Minnesota
Wright County—Mrs. G. H. Norris, Annandale, Minnesota
State President—Mrs. J. D. Lyon, 3617 Pleasant Avenue, Minneapolis, Minnesota.

The word "auxiliary" is defined by the Standard Dictionary as "giving or furnishing aid or support, especially in a subordinate or secondary manner—supplementary—accessory." I take the liberty of presenting this definition because it so well expresses the real objects and purposes of any Auxiliary to any Medical Society, and at the same time so definitely states the limitations, about which I believe there should be a clear understanding, to avoid future trouble.

Joining and taking an active part in the Woman's Auxiliary could very well be ranked as the first activity which any physician's wife should assume outside her home. The immediate welfare of physicians and their families and the future of medical practice depend upon what the public thinks and does with regard to medical practice and health activities. Organized medicine exists largely for the scientific advancement of its members, the betterment of the profession, and proper guidance of health activities. Except for scientific education, practically every purpose of organized medicine can be as well, or better, accomplished by a woman's auxiliary than by a medical society itself. Some of these activities are: The promotion of friendliness, the guidance of health activities, and health education.

It is generally true that physicians' wives are, or can easily become, active in the public health pro-

grams of the various lay organizations whose work is everywhere impinging upon medical practice. These lay health organizations accomplish great good both for the public and the profession, and auxiliary members can very easily see to it that the various lay activities with which they are connected are conducted in a way that meets with the approval of the physicians in their county. In this way a possible liability can easily be turned into a tremendous asset.

One of the favorite forms by which quackery propagates itself is through lectures offered to women's clubs and other lay organizations. The State Medical Society has a speakers' bureau which can send qualified physician speakers to any or all lay meetings. The members of the Woman's Auxiliary could very easily eliminate faddists as club speakers and also find dates for members of the state society speakers' bureau. Lay education of this sort will destroy the cults faster than any laws.

Scientific medicine needs the coöperative aid which can come through such auxiliaries. Whatever makes for better understanding between physicians and their families makes for better organizations. Nowadays women's clubs exercise a strong influence on civic affairs. A state woman's auxiliary of the Minnesota Medical Association, composed of component county woman's auxiliaries, can become a real factor in promoting public health work.

A perusal of the rules laid down by the Auxiliary to A. M. A. and to the State of Minnesota will show that the interests of the profession and of the lay public have been constantly kept in mind. A county woman's auxiliary, working along legitimate lines, can be of real aid and service, both to the profession and to the laity. The members of such an auxiliary can maintain contacts and promote interests and activities vitally concerned with the public health, and can do work for which busy physicians only rarely can spare the time.

MISCELLANEOUS

THE PRACTITIONER AND THE MEDICAL SOCIETY LIBRARY

There should be little need of speaking to physicians about the importance of a medical library. The priest physicians and astrologers and later the physicians and alchemists preserved the records of science while priests and monks preserved literary and religious records. The tradition has persisted. In many numerous visits to physicians' offices, I can recall none where there was not somewhere in sight at least a bookcase or a shelf in which there was not—also "at least"—the residual text-books used in the practitioner's medical school course, a pamphlet or two attesting attendance at medical conventions and a more or less aging pile of the Journal of the American Medical Association or some similar professional periodical.

In times not very remote the physician's library was somewhat indicative of his professional status. Not infrequently it was an asset to his estate or passed on to his successor in practice. For a long while medical theory and practice were fairly stationary. Really revolutionary literature appeared at sufficiently lengthy intervals to make it possible to keep such a collection fairly well up to date even though cupping and leeching ceased to be common, and jalap, blue mass and calomel successively lost their prestige.

In latter days, the private medical library is not keeping pace with the mechanical equipment and artistic, decorative appeal of medical offices. The reason is not far to seek. It would be carrying coals to Newcastle to speak even briefly of the manifold changes in theory, technic and practice in the profession. In fact, most physicians would consider it presumptuous for a layman to do so. The auxiliary sciences which contribute to the number and rapidity of these changes are many. They range from photography to glassmaking, from chemistry to papermaking. It is said that five hundred current periodicals of medical emphasis would be needed to make any medical library really first-class and perhaps two or three times as many more to make it approximately complete. Monographs and text-books are increasing at a similar rate. All of these are expensive to produce and the publishers do not list them at below cost prices. If the reports of the average income of physicians are correct, there are very few communities in which many practitioners could approximately keep up to date even in a special field. Moreover, the shelf room required to house the additions would soon tax the capacity of any private office. It is this relation to other library fields which gives a mere layman his excuse for speaking of medical libraries.

To meet these rapid changes, physicians seem to have developed several methods. All involve coöperation, whether the method selected is attendance at special short courses connected with hospital or medical school; attendance at even shorter courses in the form of professional conventions; formation of group clinics; or by the formation of clinic or medical society libraries. No surgeon, however skillful, even considers the acquisition of complete surgical equipment. Instead of adopting the plumbers' method of going back for tools after looking over the job, he and his patient, after the preliminary diagnosis, go to the hospital, or clinic, where combined resources have provided equipment and environment beyond the possibility of individual purses. Instead of stocking his back office with cabinets filled with jars of tablets or pint bottles of suitably colored and flavored liquids, he writes prescriptions which only the well-stocked pharmacy can be expected to fill.

Recognition of a similar need of coöperation in medical literature has fostered the foundation of medical libraries for common use wherever there is a fair-sized group of physicians, be they specialists or general practitioners. Nevertheless, it may be questioned whether medical libraries are used to more than a fraction of their potential value. Too often their care and organization are left to the leisure time of skilled phy-

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CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a young man who states that he wore a condom during sexual intercourse several weeks ago. About three weeks after exposure he noticed a sore on the penis. It gradually enlarged to the size of a ten cent piece, and was oval shaped. At present it is indurated but not painful. The right inguinal glands are enlarged and slightly tender. The left inguinal glands show slight enlargement but are not painful. I suspect that the lesion is a primary syphilitic affair. I wish to start treatment early if it is syphilitic and would like your advice as to the best way of making an early diagnosis.

   Answer.—An early diagnosis of syphilis may be made by examining material from the ulcer for spirochetes. This may be done by a dark field examination. In addition, it is advisable to take a blood Wassermann. Although the blood Wassermann is not positive in from thirty-five to forty-two days after infection, spirochetes may be found from fifteen to eighteen days after inoculation. It is necessary to have your microscope and field ready for this examination, as it cannot be sent a distance to have it done. Unless you care to wait for the blood to become positive, it would be advisable for you to have the examination done elsewhere if you are not accustomed to doing these examinations yourself.

2. *Question.*—I wonder if you could give me information about a new drug called "Tethralin," which is said to be used with success in the treatment of trigeminal neuralgia.

   Answer.—"Tethralin" (trichlorethylene) is the drug you have in mind. It was discovered accidentally that this drug had an effect on the trigeminal nerve of workers in a factory where it was used. It was thought from this observation that perhaps there was some specific effect on the trigeminal nerve, and it was therefore tried in cases of neuralgia. About twenty drops are placed on cotton and sent into the nose during an attack. Approximately half the people using the treatment reported it successful. It is worthy of trial and should be used as indicated above.

3. *Question.*—I have a young girl, eighteen years old, who has had psoriasis for the past year. I have tried thyroid extract, Fowler's solution, salicylates, and milk injections without getting any favorable results.

   Answer.—It must be kept in mind that psoriasis is a chronic, recurring disease. Therefore, no treatment that might cause serious consequences should be used unless one has had a large experience in treatment of the same. Under this heading would be included such drugs as arsenic and other agents which might of themselves give trouble. The following is recommended: (1) Have the patient anoint the body with liquid tar soap and follow with a warm bath. (2) Use ammoniated mercury ointment locally for the lesions which are most troublesome. (3) Attempt to change the patient's attitude toward the disease. Try to get her to see that psoriasis will probably be with her the rest of her days, and she should not be seeking a cure in vain, but rather relief of symptoms. Dermatologists of large experience find that this is very helpful in bringing not only physical but also mental relief to the sufferers from this disease.

4. *Question.*—I have a single female patient, age eighteen, who has been having great trouble with dysmenorrhea, requiring injections of morphine at the beginning of each menstrual period, for the past two years. Her menses began at twelve years of age and are of the regular, four week interval type. They used to last two days, but now last three days. The pain comes on at the same time as the flow and is severe and cramplike over the lower abdomen. It lasts about twenty-four hours, and is usually accompanied by vomiting. She passes no clots, but has a slight leukorrhea, lasting two or three days after menstruation. In December, 1929, she was given a general anesthetic, and dilation and curettage done, followed by the insertion of a glass stem pessary, which was left in five weeks. Bimanual examination at that time revealed no disease of the uterus or adnexa, and the uterus was normal in position. Following the use of a pessary, she had relief, but her trouble has recurred since the pessary was removed, but this does not seem to afford any relief. She has had no serious illness or injury, and her mother states that she herself never had any serious menstrual disturbance. Please advise further therapy.

   Answer.—The following suggestions have been received for the treatment of your patient: (1) Physical exercise. Many young girls who come to training schools in hospitals with dysmenorrhea seem to respond very well to physical activity. Gymnasium work is often prescribed for patients of this type, especially if they are lethargic and underdeveloped and undernourished. (2) Displacement. You have already stated that there is no displacement of the uterus, so that correction is not indicated. (3) Attempt to determine if the dysmenorrhea is of the spasmodic type. It is necessary to test the type of dysmenorrhea by giving atropine in good sized doses. Several fairly large doses should be given at the onset of menstruation; and if the pain is of the spasmodic type, it will probably give relief. (4) Benzyl succinate is commonly used. This is a soluble preparation and may be given in water, five grains every half hour up to twenty-five grains. It should be started as soon as the patient believes that she is going to menstruate. (5) Hot douches, hot sitz baths, and applications of heat are often helpful. (6) Psychic factors. This is often present, and an attempt should be made to correct the patient's attitude toward her complaint.

OF GENERAL INTEREST

Dr. Hilding C. Anderson of Duluth has announced the changing of his name to Anderson C. Hilding.

The death of John Bessesen, father of Dr. William A. Bessesen of Minneapolis, occurred in March, 1930.

Mrs. Knut Haegh, wife of Dr. Knut Haegh whose death occurred in 1925, died at her home in Minneapolis, in March.

Dr. C. B. Wright is to speak before the Georgia Medical Society at their annual meeting at Augusta on May 14. He is also to address a public health meeting.

Dr. E. E. Zemke, who has finished his hospital year in St. Mary's Hospital, Duluth, will locate in Fairmont, where he will be associated with Drs. F. N. and R. C. Hunt.

Col. Kent Nelson, director of the University of Minnesota medical unit of the reserve officers' training corps, will leave the university at the end of the school year, it has been announced.

Dr. Phoebe Pearsall-Block, who returned to Moline, Illinois, last July after five years' residence in Virginia, Minnesota, was elected president of the Moline Physicians' Club at the annual meeting held March 7, 1930.

Drs. F. H. Stangl, P. E. Stangl, C. B. Lewis and W. L. Freeman, who have been practicing under the names of Drs. F. H. and P. E. Stangl and Lewis Clinic at St. Cloud, Minnesota, joined their resources April 7, 1930, and will practice in the future under the name of Lewis-Stangl Clinic, at 101 Seventh Avenue South, St. Cloud, Minnesota.

Max Mason, Ph.D., formerly president of the University of Chicago, was elected president of the Rockefeller Foundation, to succeed George E. Vincent, Ph.D., who retired January 1, 1930. Dr. Mason was assistant professor of mathematics at Yale from 1904 to 1908 and professor of mathematical physics at the University of Wisconsin from 1908 to 1925.

Phyllis Jeannette Kay of Little Falls, Minnesota, has been selected as the state winner in the second annual Gorgas Memorial Essay Contest. The subject this year was "The Gorgas Memorial, Its Relation to Personal Health and the Periodic Health Examination" and the national winner to be chosen in May from the selected winners in each state will receive the $500 cash prize offered by Mr. Charles R. Walgreen, of Chicago, of drug store fame.

After nine years of preliminary effort a Royal College of Physicians and Surgeons of Canada was established last November 20th. By an act of Parliament one hundred and forty-four professors of medicine, surgery, gynecology and obstetrics at the University of Toronto, McGill University, Laval University, the University of Montreal, the University of Manitoba, and the University of Alberta, were made charter members of the organization.

The American Hospital Association has designated May 12 as National Hospital Day. This particular day was chosen because it is the birthday of Florence Nightingale, who is rightly credited with having done so much for the nursing profession and also in raising the standard of hospital service. The public is being urged to pay a visit to a hospital on this date to become better acquainted with the nature of the service the hospitals are providing.

Minnesota's birth rate for 1929 was the lowest in the history of the state, according to a recent report of the vital statistics division of the state board of health.

During the year there were 46,502 births, a rate of 17.08 per 1,000. Since 1915, when the rate was 24.6 per 1,000 persons, there has been a steady decline in the birth rate. The statistics showed that the greatest number of births occurred during March, with 4,298. The death rate for the year also was one of the lowest on record, totaling 25,677, or 9.4 per 1,000 persons. Only in 1927, when the rate was 9.2 per 1,000, has the figure been bettered.

State Association News

The series of Colloquium lectures offered by the Committee on Hospital and Medical Education is proving decidedly popular this year. Willmar, Brainerd and Winona booked the course within 48 hours. Faribault, Litchfield and Owatonna made immediate inquiries.

Only five courses are to be given this spring, though more will be offered in the fall if possible, the committee announces. At least twenty medical men are asked to enroll for each.

The course includes eight programs spread over a period of eight weeks. Tuberculosis, cancer, obstetrics, hospitals, heart disease, immunology and public health are among the subjects scheduled for lecture and demonstration. The committee is to be congratulated on having secured five of these events without cost to those who book them.

President S. H. Boyer, E. A. Meyerding, Herman Johnson, and C. B. Wright, executive officers of the state association, will go to Marshalltown, Iowa, to address the annual meeting of the Iowa State Medical Association, May 14. On the way they will attend a special meeting of the Mower County Medical Society to be held at Austin, May 13.

N. O. Pearce, Minneapolis, addressed the Rice County Medical Society at Faribault, April 23, on "Pediatrics."

Bulletins were sent by the Educational Committee of the state association to Minnesota newspapers during the past month on the following subjects: "Heart," "Carbuncle," "Arthritis," "Eyestrain and the Movies," and "Tuberculosis." The last was designed to coincide and coöperate with the regular April diagnosis campaign carried on by the National Tuberculosis and the Minnesota Public Health Associations.

George Earl, chairman of the Committee on Public Health Education, spoke before the St. Cloud Stearns-Benton County Medical Society at St. Cloud, April 17.

There is no statutory provision in the laws of Minnesota compelling a physician or hospital to keep *x*-ray films for any definite length of time. Such is the finding of F. Manley Brist, attorney for the State Board

of Medical Examiners, who has made an exhaustive search of the laws of the state following a discussion of the matter at the Secretaries' Conference in St. Paul.

It is Mr. Brist's opinion, however, expressed in a letter on the subject received at state association headquarters, that all films, plates and like records be kept for a period of two years, at least, from the date of the work.

In the Minnesota statutes of 1927 covering malpractice suits, such suits must be commenced within two years, Mr. Brist points out, with this exception—that the statute does not exclude suits by persons under 21 years of age even after the two-year limit, until such persons have attained their majority.

Dr. F. E. Harrington, Commissioner of Health of Minneapolis, is directing the third annual campaign for the prevention of tuberculosis in Hennepin County. Nationally observed by tuberculosis associations throughout the country during the month of April, the local program of education in the prevention of the white plague will take place April 21 to May 1. Because of his connection with Lymanhurst, America's first school of its kind for tuberculous children, and his activity on committees of the National Tuberculosis Association, Dr. Harrington is especially qualified for leadership in the campaign which will reach into every home in the county, focusing public attention on the importance of early diagnosis of the childhood type of tuberculosis.

THE PRACTITIONER AND THE MEDICAL SOCIETY LIBRARY

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sicians who have little leisure time. Much routine work, which could be done better by some one specially trained to do it, is undertaken by physicians who know little about it. In too many cases, physicians who would not think of compounding prescriptions or of repairing their surgical instruments, load themselves with business details of book ordering, bibliography, abstracting and the like, which a good librarian could do as well or better in much less time and at less expense. This is true in even greater measure of the individual library work of the physician. His time can be saved in large measure by a good medical librarian. If she cannot do it, either she is not a good librarian or the work requested involves difficulties not previously suspected or anticipated. Exploration is often as necessary in medical work as in surgery and it sometimes reveals as unexpected complications.

The medical society library increases the possibility of securing the latest information on any medical subject because it represents or should represent the varied interests of the society it serves. Modern diagnosis is considered more accurate because it represents the combined or compromise opinions of several qualified experts, each looking at many of the same phenomena from different angles and discovering new symptoms. It is logical to expect also that the reports of study in different fields, of conditions much the same but with differing relations, should lead to more exact appraisal of phenomena in any or all of these fields. In other words, really significant data are much less likely to be overlooked by the many than by the individual.

The probability that really worthwhile material on the subject in question will be available is greatly increased when such material is selected by a variety of experts and, when acquired for the library, subjected to criticism by the other experts who use it. Every one using the library may partake of the advantages arising from such critical appraisal. He is in consultation, through the books and periodicals, with his colleagues who have already consulted them.

In many cases, the medical society library of moderate size is of greater direct value in practice than the larger medical school or great metropolitan society library which is used also for purposes of research. It must be selected with more discrimination because there is less money behind it. Practice must depend on research, but practice is not primarily research. The obscure symptom may often be interpreted only by a post-mortem and a series of later laboratory tests. This truth does not overcome the natural objection of most patients to advance science by personally furnishing post-mortem material. The reputation of the university professor may properly be based on lengthy laboratory studies and protracted analysis, but the professional and financial success of the practicing specialist is not based on similar methods. He seldom has time for lengthy study on a serious case. He must and does study the result of others' work as they report it.

The monograph which codifies the best average practice is often more serviceable to him than the promising but inconclusive experiment which he uses mostly when favorable conditions permit experiment or when desperate conditions suggest it as a last resort. The medical periodicals which the medical society library takes and keeps should also be chiefly those which stress the applications of medical theory or biological research. The practitioner, therefore, will often find in his own society library a collection of greatest value.

In communities like Minneapolis and St. Paul, there is a very definite place for the medical society library. It supplements the personal office library and reduces the necessary expenditure for it. In most cases, the society library will be adequate for the immediate needs of average practice. Where it is not, or where the specialist desires to pursue his research further, the large and rapidly growing biological-medical collection of the University of Minnesota is at his service, for almost unrestricted reference use within the library building. Private office, medical consultation and clinic or hospital (or both) are successive stages in medical efficiency. Private office reference collection, medical society library and large medical school or university reference library should be no less recognized as similar opportunities for medical and surgical effectiveness.—Frank K. Walter in Bulletin, Hennepin County Medical Society, Vol. 1, No. 5.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of March 12, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 12, 1930. Dinner was served at 7 P. M. and the meeting was called to order at 8 P. M. by the President, Dr. Emil S. Geist. There were 50 members and 1 guest present.

Minutes of the February meeting were read and approved.

The Secretary read the report of the Executive Committee meeting held earlier in the evening. This was approved.

The scientific program of the evening consisted of a paper and two theses, as follows:

DR. WILLIAM F. BRAASCH (Rochester) read a paper on "Congenital Failure of Renal Rotation and Associated Anomalies" and showed numerous lantern slides of these anomalies.

DISCUSSION

DR. CAMPBELL BEGG (Wellington, N. Z.) (by invitation): Mr. President and Members of the Minnesota Academy of Medicine: I have to thank you very much for your welcome this evening. I feel it a great privilege that, thanks to the courtesy of Dr. Braasch, I am able to be present at one of your meetings. St. Paul and Minneapolis are well known to me through the preëminent men they have produced in various spheres of medicine. I also appreciated very much Dr. Braasch's masterly presentation of this subject. When pyelography is mentioned throughout the world, his name is certainly the one uppermost in all minds as the one who established the procedure on a practical basis.

The discussion of such a paper on short notice is not easy. The subject is most important from the point of view of the general surgeon as well as the urologist. Some of the bizarre shadows shown tonight are reminiscent of a zoölogical garden. The figures of many familiar animals can be seen in these shadows. I always picture the pyelogram of the non-rotated pelvis by comparing with a kangaroo. It can appropriately be called the "kangaroo" pelvis, the tail being the ureter. To work out theories of the formation of the anomalies of the urinary tract on the accepted developmental facts is rather an interesting pursuit, but when we find the axioms wrong the whole ingenious theory is apt to crumble. I remember in a paper working out the method by which aberrant ureters are produced by the assumption of the usual idea that the ureter comes as a bud of the Wolffian duct which forms the trigone and posterior urethra. Unfortunately and much to my annoyance, I read an article last year by a German writer contending that the Wolffian duct did not do this at all!

It is very difficult to analyze the factors that make the kidneys in their ascent adopt one position or the other. We might assume the slope of the psoas muscles as one of the factors of rotation, but when Dr. Braasch has shown that many of these non-rotated organs still retain fetal lobulation, it almost makes one think that a definite urge is present in the kidney itself. Immaturity in constitution leads to abnormality in position.

I see, however, no reason why kidneys retained in the pelvis should not come to lie on their side. The room in the pelvis is needed for other purposes and the kidneys are pushed by pressure into the position where they will take up least room, *i.e.*, on their sides—sometimes on one, sometimes on the other.

There is a type of fully-developed kidney which appears normal in the pyelogram and in which the pelvis lies in front of the vessels. This, incidentally, is one of the criteria by which to decide whether the displacement is by acquired torsion or is congenital. In torsion the relation of the vessels to the pelvis remains normal. Many years ago Dr. Charles Mayo advocated exposing the kidney pelvis from behind to remove a stone from it, and then to cut boldly down on the stone through the fat and other tissues without dissecting out the pelvic wall. The idea was to prevent fistula. Once when about to carry out this technic, I looked more closely at the structures and found that the pelvis was in front of the vessels, so that a bold incision from behind would have traversed the renal vessels before reaching the stone.

Abnormal renal arteries are the rule rather than the exception. On one occasion I encountered a pyelectasis caused, or at least accentuated, by an aberrant renal artery which was almost the sole supply of the kidney. It entered the lower pole. As I could not cut the artery without destroying the kidney, I cut the dilated pelvis right across the ureter and the lower section of the pelvis below the artery and brought it up on the other side. The result seemed to be satisfactory.

I should like again to say how great a pleasure it has been to be here tonight, to have heard such an excellent paper, and to have had the opportunity of meeting you all.

DR. F. E. B. FOLEY (St. Paul): I have been delighted with Dr. Braasch's presentation, and greatly instructed, but simply astounded by the amount of his material shown in the lantern slides. Such an array of anomalies is remarkable.

The importance of anomalies of the upper urinary tract as a subject of clinical urology is not generally appreciated. On a summary analysis of our own material it is found that, if cleavage anomalies (duplications) are included, these conditions are even more frequent than renal tuberculosis.

A good grounding in the pathology of urinary tract disease, of course, is essential in clinical urology. Knowledge of upper urinary tract embryology is likewise essential in clinical problems in which renal anomaly is concerned. That such anomalies are so frequent emphasizes the importance of at least a working knowledge of this embryology. If one is to have much to do with diagnostic and surgical urology, this is of great importance, and only by understanding the morphogenesis of these anomalies may findings indicating their presence be properly interpreted.

Dr. Braasch, in spite of my efforts, still refers to anomalies of Form, Position and Number. This old classification is arbitrary and does not take into account facts of development. Some time ago I submitted a new classification based on the morphogenesis of these malformations. According to this, anomalies of the upper urinary tract are divided into three groups according to the primitive organ from which the malformed structure derived: (1) The Renal Blastema (kidney proper). (2) The Wolffian Duct (ureter, pelvis, calices, excreting ducts). (3) The Vascular Channels (renal blood vessels).

In the first group belong the anomalies of form, such as lobulated kidney, polycystic kidney and the fusion malformations such as horseshoe kidney, unilateral fused kidney and malpositions such as ectopia and malrotation of the sort described by Dr. Braasch.

In the second group belong the cleavage anomalies, usually referred to as duplications, complete or partial. Abnormal position of the ureteral opening within the bladder, urethra, genital tract or rectum also falls into this second group. It includes also those structural narrowings of the excretory channels occurring as congenital strictures of the ureter, uretero-pelvic junction or calices. The third group is comprised of anomalies of the renal vascularization.

Dr. Braasch enthusiastically approved of this classification when it was first presented.

There is one point in regard to the interpretation of pyelograms showing under rotation of the kidney which Dr. Braasch did not mention, but one which is of great aid in recognizing the exact condition present. Whether or not attention has been called to it by others, I do not know. As indicated by Dr. Braasch, there may be malrotation either alone or in conjunction with fusion. It is of great importance to differentiate between the two. Even with a pyelogram on only one side, the differentiation may usually be made by the presence or absence of what I have called the normal "axial deflection of the kidney." When the kidney is first formed down near the lower end of the Wolffian duct and during the early part of its ascent, its axis is oblique from above toward the midline below. During the latter part of ascent this axis is deflected and becomes oblique, from below toward the midline, above. With simple under rotation this normal axial deflection is present. Fusion of the two kidneys prevents this occurrence and axial deflection is absent. Thus the presence or absence of normal axial deflection is a criterion for differentiating between simple under rotation and fusion anomaly.

Dr. R. E. Scammon (Minneapolis): I don't know that I can add much to the discussion. Problems of this kind interest the embryologist very much and we all appreciate their being brought to our attention. When one considers the number of things that take place in the development of the kidney, it is not surprising that we find these anomalies. Most anomalies consist either of structural defects, occasionally growth anomalies, or of perversions of position. The kidney is one of the organs which may have all of these developmental defects. The kidney is also peculiar in the respect that these anomalies occur much later than is usual, *i.e.,* between about the fourth week and, perhaps, the sixth week after conception. These anomalies of the kidney are, most of them, a good deal later —a matter of later embryonic period or extending into fetal life.

So far as I know, we find deflections or rotations of major importance in the body in the following places: in the heart, in the gastro-intestinal tract, in the uterovaginal canal, and this one just pointed out in the kidney. These are the main places where we find a deflection by axis rotation. It seems to me we know very little about these deflections in the axes of organs or systems. The mechanism of heart rotation seems to fit fairly well with certain known principles of hydrostatics. The anomalies that we find in the uterovaginal system seem to occur very much later and are probably tied up with the rapid growth of the pelvic colon and certain other pelvic viscera. But we know much less of these anomalies of axial positions of the gastrointestinal tract and the kidneys and ureters. Some work done by Cary indicates that rotation of the gastrointestinal tract is probably an interstitial matter; that it is not due to mechanical pressure but to the fact that the cells of the tract grow in very definite zones. Why this is so, we do not know. It seems quite probable that this unequal growth is responsible for the rotation of the digestive tract. I am inclined to think that if we had an analysis of this kind for the kidney and ureter, we might find the same thing to be true.

The secondary changes that we get in fetal life do not seem to be tied up with pressure. I am inclined to think that these very interesting anomalies will be found to be tied up with the rates of growth in certain zones; that some parts of the tract have marked powers of growth and some practically stand still. I would suggest that this is probably where we are going to find the explanation for these interesting anomalies; that it is in some growth phenomenon rather than in some mechanical phenomenon that we will find the true cause of these modifications in development.

Dr. Arnold Schwyzer (St. Paul): It just occurred to me (while listening to Dr. Foley's remarks) whether it could not be that this inward rotation of the upper pole, while the kidney gradually ascends, is due to the pivoting around the origin of the renal artery. The renal artery with its different branches holds the kidney while it ascends, so that, when the kidney comes up, the artery with its branches would rotate the pole. Perhaps the blood waves through the branches have a mechanical action to steady the distance of the poles from the main artery. I wonder whether there would be anything to that view.

Dr. William F. Braasch: I am certainly very grateful for the generous discussion of my paper. In answer to the last suggestion made by Dr. Schwyzer, one man's theory is probably as good as another's and that appeals to me as a very plausible one. In reply to Dr. Foley, I will say that I still think his classification is a good one and I tried to use it in this paper, but found this was so broad that I could not, and had

to go back to the old form. I hope this paper may have aroused some interest in this rather unusual field.

Dr. Charles N. Spratt (Minneapolis) read his thesis entitled "A Review of 100 Cases of Intraocular Foreign Bodies." Lantern slides and various instruments were shown.

Dr. Spratt: At this time it is proper and right that I should acknowledge my appreciation of election to this ancient and honorable body. In February I completed 25 years in the practice of medicine in this city and this comes as a sort of consummation of that event. In that 25 years I have seen 22,400 patients, two-thirds of them eye patients. Among the latter were 98 individuals who had intraocular foreign bodies; 3 had foreign bodies in both eyes, making 101 cases of intraocular foreign bodies.

DISCUSSION

Dr. John F. Fulton (St. Paul): I rise more for the purpose of congratulating the Academy on having Dr. Spratt as one of its members and to bid him a joyful welcome rather than to take part in the discussion of his paper. The contribution which he has given us is a very valuable one, as much so as any ophthalmologist that ever contributed to the Academy. I shall not enter into the history of methods of treatment of intraocular foreign bodies but refer you to a very excellent and reliable paper by Walter V. Moore, of Brooklyn, published in the 1924 volume of the American Journal of Ophthalmology in which he gives credit to Dr. Nikolous Meyer as being the first to extract steel from the eye with a magnet. He quotes from the original paper by the author in which he says that he succeeded in removing a needle-shaped piece of steel after having failed to remove it by means of the usual instruments, saying that he combated the subsequent inflammation by the use of leeches and cold packs. The two great leaders who developed and popularized the use of the magnet for removing foreign bodies from the eye were Julius Hirchberg, of Berlin, and Haab, of Zurich. Hirchberg became dissatisfied with the fixed magnet as being clumsy and inconvenient so he invented the electromagnet, removing foreign bodies by opening the vitreous chamber when situated in that part of the eye. We are using about the same magnet today with the addition of greater power as demonstrated by the Sweet magnet. Dr. Haab, not being satisfied with the magnets in use, invented his giant magnet which he demonstrated at the Ophthalmological Congress in Heidelberg in 1902. His idea was to add power to the instrument, believing that the greater the power the better the chances for success. He strongly recommended always to remove the foreign body through the route that it entered, opposing posterior sclerotomy.

A few years ago it occurred to Dr. Jackson that the magnet could only remove foreign bodies when it was able to overcome the grip of the ocular tissues and he maintained that it was just as important to loosen this grip as to increase the power of the instrument; so he suggested the use of the electromagnet scissors for this purpose, and succeeded in obtaining excellent results in this way when the magnet itself failed.

Only a few reports such as Dr. Spratt has given us tonight have been published. Haab reported 165 cases; failed in 25 of this number; and succeeded in removing the foreign body from 141. He enucleated 39. Cataract developed in 71, extraction of which produced excellent results in 51. Fisher, of Chicago, reported 150 cases, in 4 of which steel was found in the eyeball after enucleation. He obtained good results in 96 of these cases. The excellent results obtained by the reports here briefly analyzed, together with the very excellent analysis made by Dr. Spratt this evening, indicate the most gratifying results obtainable by the magnet. This is all the more wonderful when I remember that before its invention the very best oculists claimed that a foreign body in the vitreous chamber demanded enucleation. Criedland recently reported 76 cases, of which 43 were saved and 33 enucleated. His results demonstrated that the more anterior the foreign body was located the better the results. Twelve of his cases developed cataracts, 10 of which were successfully removed with complete restoration of sight. He always waited until the opacification was complete before extraction. Clinical experience demonstrates that the lens is more tolerant to foreign bodies than any other part of the eye. I refer you to a paper by Dr. Nikolaus Blatt, of Transylvania, published in the February number of the American Journal of Ophthalmology, in which he carefully points out the importance of conservatism in treating foreign bodies located in the lens.

Dr. Frank Burch (St. Paul): We have much enjoyed this presentation by the essayist. One point learned from experience is concerning the presence of a foreign body in so-called idiopathic iritis. In 6 instances which I can recall, an apparently idiopathic iritis was found to have been caused by an intraocular foreign body. Only by a careful history of what transpired preceding the iritis can the possibility of a retained foreign body be disclosed. Two of my cases were in children, and in each instance what might have been a serious affair, as regards the future of the eyes involved, was prevented by the discovery of a foreign body within the eye, in one instance with the aid of the *x*-rays. In one case of a man who had developed an extremely persistent iritis with hypopyon, the condition was treated for three weeks with careful study for focal and systemic infection, until a more careful inquiry revealed the fact that three weeks preceding the onset of inflammation he had been hammering a plowshare and had felt something strike his eye with only temporary irritation. He had not associated the late inflammation with the previous injury.

In two other instances the patients could not even remember having received any injury although in one case the ophthalmoscope, and in the other the *x*-ray, revealed the presence of a foreign body in the choroid. The history of every patient with iritis should be carefully taken to cover such contingency.

The tolerance of the eye for metallic as well as nonmetallic foreign bodies is at times very surprising. In one instance a piece of glass penetrated the eye following a laboratory explosion and was retained about three

years until it was successfully removed with preservation of vision. Twice during the past few years encysted cilia have been removed after entering the eye through incised wounds of the cornea. A few weeks ago my associate removed a piece of steel from the lens of an eye which had remained there for about a year and had developed cataract, but at no time was there any severe reaction in the eye. Copper is peculiarly prone to cause disturbance. I have in the hospital at this time, a patient with copper retained within the eye in whom I have successfully removed a cataract without any inflammatory reaction. I believe he will eventually develop iridocyclitis as copper produces chemical changes which seem to be extremely irritating. Copper will produce a leukocytic pus within the eye without actual infection. In 8 or 9 shot cases which I have seen there has never been a case of sympathetic ophthalmia. In fact, I have never personally seen but one case of sympathetic ophthalmia following retained foreign body.

Dr. Spratt mentioned a subject which I would like to discuss further, namely, the fallibility of the *x*-ray localization. Once in my experience the *x*-ray examination did not reveal a foreign body; in another the triangulation showed the foreign body to be outside the globe. In both instances siderosis subsequently developed and in one of the patients enucleation was necessary. As Dr. Spratt mentioned, repeated *x*-ray examinations should be made, when necessary, if the history indicates the possibility of a foreign body. Also I know of cases where foreign bodies have been reported which could not be removed with a magnet. The eyes were removed and the foreign body was found embedded in the sclera in a harmless position. The difference of 0.5 mm. in triangulation measurements is sometimes a very important matter.

A hopeful phase of this subject is the fact that fewer foreign bodies in the vitreous are being seen because more men are wearing goggles in their work, and the use of non-shatterable glass in goggles affords added protection. Unfortunately most of the accidents we see are in garages or in industrial plants where these precautions are not observed. I believe in some states the Industrial Commissions insist on the observance of all precautionary measures, including goggles, if the employees are to receive compensation for external or for intraocular foreign-body injuries.

Dr. John Brown (St. Paul): One thing has appealed to me which I do not know whether or not Dr. Spratt has thought of, and that is the tolerance, or intolerance, for foreign bodies for the individual in the eye itself. There is something inherent in the individual himself which makes this tolerance to a foreign body, when another one would not tolerate it at all, and whose eye may go on from bad to worse before the patient arrived at the oculist's. In my experience the young individual is much more prone to these disturbances than the adult. I presume the lens structure has more resistance in adults. In many instances you will have loss of the lens substance if the foreign body pricked the lens and many go on to cataract. I am beginning to feel that an adult with a foreign body in the eye is a much better risk than is the juvenile.

Dr. Spratt (in closing): This subject, of course, is so interesting to ophthalmologists, that we could talk all night. Each case is a story in itself. I have seen two cases with cilia in the eye and left them alone. They are not included in this series. There were two or three in this series that did not know they had a foreign body in the eye. One boy was hanging around a blacksmith shop, and later developed pink-eye, which, however, proved to be an intraocular foreign body. The important points of the whole subject are these: (1) Is the foreign body clean or dirty? (2) Whether it is clean or dirty, the accurate localization is absolutely essential if you are going to treat it properly. If it is back of the eye, leave it alone.

Dr. Fulton: Did any of those patients have glass in the eye?

Dr. Spratt: There was no glass; four of them had pieces of granite.

Dr. T. A. Peppard (Minneapolis) read his Thesis on "Pericarditis" and showed lantern slides.

The meeting adjourned.

R. T. La Vake, M.D., Secretary.

TRANSACTIONS OF MINNEAPOLIS SURGICAL SOCIETY

Meeting of April 3, 1930

The monthly scientific meeting of the Minneapolis Surgical Society was held in the Lounge of the Hennepin County Medical Society April 3 at 8 P. M. with the president Dr. S. R. Maxeiner presiding.

Dr. Martin Nordland presented a paper on "The Larynx—Its Relation to Thyroid Surgery." This showed much original work in the way of anatomical dissection as well as conclusions drawn from his wide surgical experience. This paper has been accepted for publication in the Journal of Surgery, Gynecology and Obstetrics and will appear in a future issue of that journal.

The discussion of Dr. Nordland's paper was opened by Drs. Fowler and Hanson.

DISCUSSION

Dr. L. Haynes Fowler: I first became particularly interested in the anatomy of the superior laryngeal nerve several years ago when Dr. William A. Hanson and I dissected over two hundred thryoid glands, the results of which were reported in a paper read before this society in October, 1928, and published in Surgery, Gynecology and Obstetrics July, 1929. In that work our efforts were directed especially toward establishing more accurate information regarding the relations of the recurrent or inferior laryngeal nerve. However, we did at that time note the very close relation between the superior laryngeal nerve and the upper pole of the thyroid gland and expressed the opinion that injury to this nerve might be the cause of some of our postoperative vocal disturbances.

This is demonstrated by the results of the work which Dr. Nordland has given us to-night. He has shown very clearly the close relation of the internal branch of the superior laryngeal nerve to the upper pole of the thyroid gland, and secondly has demonstrated that this nerve supplies motor fibers to the interarytenoid muscle, instead of being a purely sensory nerve to the larynx.

To me this means therefore that we can no longer handle the superior pole of the thyroid gland with impunity but that we shall have to consider the branches of the superior laryngeal nerve as well as those of the recurrent laryngeal nerve a real source of danger in thyroidectomy and govern our operative technic accordingly.

Dr. William A. Hanson: We are much interested in this anatomical and physiological report regarding the external laryngeal nerve, a branch of the superior laryngeal nerve. This nerve, as we found it, passes obliquely downward and medially, crossing posterior to the internal and external carotid arteries and between the upper pole of the thyroid and the lamina of the thyroid cartilage, and innervates the cricothyroid muscle. Here we have a close relation to the superior thyroid arteries.

The physiology of the nerve is not definitely known. Experimental work by cutting this nerve has been done in dogs but no effects on the vocal cords were produced.

We called attention to this nerve in our report on the surgical anatomy of the thyroid gland with special reference to the relation of the recurrent laryngeal nerve which we presented before this Society in October, 1929, starting a further investigation of the nerve in order to determine whether or not we are overlooking a definite anatomical structure, injury to which may be causing some post-operative vocal disturbances, and shall be interested to know what conclusions Dr. Nordland finds in his problem regarding the physiology of the external laryngeal nerve.

In 262 of our 400 cases, or 65%, the nerve passed posterior to main branches of the inferior thyroid artery, and in 104 of 400 cases, or 26 per cent, it passed anterior to the main branches of the inferior thyroid artery. In 34 cases, or 8.5 per cent, it passed between the main branches of the inferior thyroid artery.

Dr. E. K. Green presented a case report of an unusual case of acute intestinal obstruction.

A CASE OF ACUTE INTESTINAL OBSTRUCTION

Dr. E. K. Green: The following is the report of a case of acute intestinal obstruction in a girl twelve years of age resulting from a chronic intussusception which gave irregular symptoms for about two weeks.

There was no history of previous attacks except when she was about six years of age her mother said she had had a stomach upset which lasted four or five days.

She was first seen in this attack November 3, 1929, at which time she had a little nausea and slight abdominal pain. Between then and Nov. 12, 1929, she was seen twice and at no time was there any definite signs of impending danger. Her symptoms were those of nausea, irregular pain, diarrhea at times, and again was entirely free from symptoms to such an extent that she had a party for some of her friends. Her mother was a Christian Scientist and consequently minimized her symptoms and gave very little coöperation. On November 14, 1929, after about twenty-four hours of severe come-and-go pains with nausea, some vomiting and obstipation, she presented a very different picture. She was very definitely dehydrated and her abdomen was distended. Her pulse was 130 or more. Dr. C. W. Pettit, who had been in charge of the case, then made a very positive diagnosis of acute obstruction and sent her to the hospital for immediate operation.

My reason for reporting this case is to show how, in desperate cases, with conservative methods and careful management, we are able to get by and obtain a final recovery.

At the first operation we found about twelve or fifteen inches of terminal ilium intussuscepted into itself forming a tumor nearly the size of the fist, which was held by light adhesions in the pelvis. On lifting it out, we found about 1.5 inches of collapsed ileum proximal to the ileocecal valve and a Meckel's diverticulum just proximal to the tumor. The proximal ileum was greatly distended, thickened and filled with a semi-liquid which was impossible to remove with a sucker. In our efforts to untangle the intussusception, we found the bowel ulcerated through, making it impossible to prevent the escape of feces. Because of her desperate condition, we stitched the gut to the wound and drained the proximal loop.

By way of management, when she came to the hospital, while setting up the operating room, we gave her 1,000 c.c. of normal saline under the skin. As soon as she was returned to her room, after the operation, we gave her 1,000 c.c. of 3 per cent salt and 1,000 c.c. of normal saline. She took, in addition, 2,000 c.c. by mouth during the first twenty-four hours. She weighed only about 60 pounds and with 5,000 c.c. of water within twenty-four hours, she reacted very nicely. During the next eighteen days our only effort was to get her in shape for the ultimate removal of the tumor and anastomosis of the gut. Once we took her to the operating room to untangle the intussusception to relieve her of constant pain and discomfort. We made an effort to close the gut at that time, but it soon ulcerated through.

As we were about to do the final operation, we were delayed for a few days because of a bowel upset in which she had numerous watery irritating stools. On December 2, 1929, we did the final operation which consisted in removing the gut in the intussusception with its mesentery and uniting the cut ends. Because of the short distal loop of the ileum, I used a Murphy button for the anastomosis and to our surprise the abdominal wound united by first intention and there were no signs at any time of either local or general peritonitis. The patient passed the button on the seventh day and aside from mild symptoms of obstruction for about twelve hours, two days later, she made an uncomplicated recovery.

The discussion of Dr. Green's case report was opened by Dr. Owen Wangensteen.

DISCUSSION

Dr. Owen H. Wangensteen: Dr. Green's case is interesting from several standpoints. Intussusception occurs most frequently between the fifth and ninth months of life. About 75 per cent of bowel invagination occurs during the first two years of life. Its occurrence in male infants is three times more frequent than in females. After the age of three, intussusception is relatively infrequent and an inciting agent in the nature of Meckel's diverticulum or a tumor in the bowel is frequently present. In patients suffering from intussusception who have passed the age during which telescoping of the bowel is common, such a predisposing mechanism as was present in Dr. Green's case is to be suspected. Eliot and Corcasden in a review of 300 cases of intussusception in adolescents and adults found a tumor or a Meckel's diverticulum to be present in one-third of the cases. Benign tumors are more frequent offenders than malignant neoplasms and the small intestine more often concerned than is the colon in cases of intussusception at this time of life. Chronic or recurrent intussusception is more prone to occur in adolescents and adults and a tumor of the bowel is not an unusual finding in such cases.

In irreducible intussusceptions of the type presented by Dr. Green, excision with primary anastomosis or exteriorization are the Surgeon's only alternative. In a poor risk, Dr. Green's choice of exteriorization carries the lesser risk. The performance of an intestinal anastomosis in the presence of an acutely distended intestine is a hazardous undertaking and is to be religiously avoided. If the temporary fistula in the bowel proves to be high, the content discharged from the proximal loop is to be collected and poured into the distal through a urethral catheter. A patient can be tided through a crisis by this compromise and an intestinal anastomosis more safely made at a later date.

Infants with intussusception stand intestinal resection very badly and a non-viable segment in such a patient is synonymous with an extremely bad prognosis. In 1913, Dowd could find but eight cases under one year of age that had survived intestinal resection for bowel invagination.

In an invaginated bowel in which the intussusception is viable but not reducible, a maneuveur suggested by H. P. Brown of Philadelphia in 1926 appears to be especially meritorious; calling attention to the fact that the edematous neck of the intussuscipiens or ensheathing layer prevents the reduction of the apex of the intussusception, he cuts the cuff of the ensheathing layer with scissors which permits of prompt reduction. The resulting linear incision is then closed with Lembert sutures.

Almost universally in our textbooks of surgery, operative reduction is extolled as the only safe method of dealing with intussusception. Recently, however, Hipsley of Sydney, Australia, who to date can boast a better result in the operative treatment of intussusception than any surgeon with whose reports I am familiar, has not only had success with the non-operative method but forcibly states that no surgeon should have recourse to surgery without giving the non-operative method a trial. In the Medical Journal of Australia for 1918, Hipsley reports 51 consecutive successes with operation for intussusception in patients whose duration of symptoms was under thirty-six hours. Despite this admirable result, in a subsequent larger series reported in 1926 he finds the conservative method of reduction by water enemas at a gravity pressure of 3.5 feet to be successful in 62 per cent of instances.

Hirschsprung popularized the method many years ago at the Queen Louise Hospital in Copenhagen, but the method has never received universal approval. Hirschsprung as well as his successor, Monrad, employed chloroform anesthesia and combined enemas with manipulative taxis through the abdominal wall.

The advocates of the method limit the employment of this procedure, however, to colic types of bowel invagination alone; 75 per cent of intussusceptions being of the ileo-cecal variety (the caput caeci constituting the apex of the intussusceptum) the majority of instances are amenable to a non-operative attempt at reduction. Intussusception of the small intestine, viz., pure enteric types as the one reported by Dr. Green, and ileo-colic intussusceptions are not suitable. The "Achilles' heel" in Hirschsprung's method is that natural evacuation of the bowel has to be awaited to confirm a satisfactory and complete reduction, a decidedly unsafe criterion.

Pallin and Olsson of Key's Clinic in Stockholm have employed the hydrostatic pressure of a barium enema to accomplish the reduction in colonic types of intussusception as well as for immediate fluoroscopic control of complete reduction. During the past year at the University Hospital we have had an unusually large and interesting group of cases of intestinal obstruction and among them several cases of intussusception. We have employed this method with success and can endorse its use for colonic types of intussusception. The barium enema method not only shows the defect present but serves as an immediate control of adequate reduction. If the method fails, no harm has been done and resort can be had to operation without serious loss of time.

Dr. Stanley Maxeiner: There is one point that I should like to call attention to concerning the diagnosis of intestinal obstruction in general, viz., the unreliability of enemas as a diagnostic criterion of the existence of intestinal obstruction. There exists a general unwillingness to accept the diagnosis of intestinal obstruction as long as the patient expels an enema with the return of gas and feces. Recently, together with the aid of Mr. Goehl, a Senior Medical student, I established complete obstructions in dogs by cutting the small intestine across and inverting the ends. Invariably these dogs expelled gas following the administration of Noble's enemas. When a catheter was threaded into the distal segment and barium introduced, its transit through this distal bowel was accomplished in normal time. Dr. Herbert A. Carlson and I have since put balloons into the distal segments of dogs with complete obstructions and observed that the contractility of this bowel is much like the normal. The bowel

distal to the obstruction is physiologically as well as anatomically normal. Why shouldn't it expel gas following the administration of an enema?

In a complete low obstruction, enemas may continue to serve as a fairly reliable index of bowel obstruction, but in high obstructions as well as in partial obstructions it is a decidedly unsafe criterion. I do not deprecate their administration in suspected cases of bowel obstruction, but the interpretation of the data obtained by this means must be adjudged critically. It is a good plan to give such a patient two enemas. Unless the obstruction is low in the colon gas and feces will be returned with the first enema. If, however, no return of gas or feces is obtained with a second enema, administered half an hour after the expulsion of the first, evidence for the existence of an obstruction probably low down in the intestine is obtained. But the persistence of pain of an intermittent crampy nature, despite the return of enemas, is adequate indication for immediate operation.

The meeting adjourned at 10 P. M.

H. O. McPheeters, *Secretary.*

OBITUARY

C. Eugene Riggs

(1853-1930)

Dr. C. Eugene Riggs, Saint Paul, the first physician in the Northwest to specialize in nervous and mental diseases, died at his home, April 3, 1930. The following record of his life was dictated by Dr. Riggs some six years ago:

"Dr. C. Eugene Riggs was born in West Unity, Ohio, in 1853. He belonged to an old and well-known Maryland family whose members played prominent parts in early American history. His early education was in the public schools of Bryan, Ohio. Entered Ohio Wesleyan University in 1873; received the degree of A.B. in 1877 and that of A.M. three years later. Studied medicine in the office of his brother, Dr. J. U. Riggs of Bryan, for two years, in the good old-fashioned way. After this had one year in Medical College at Nashville, Tenn. Graduated in 1880 at the College of Physicians and Surgeons, Baltimore, Md. This was later merged in the Medical Department of the University of Maryland. Spent one year as senior interne at the Woman's Hospital, Baltimore.

"Came to St. Paul in the spring of 1881 and engaged in the general practice of medicine. The following year he was given the chair of neurology and psychiatry in the St. Paul Medical College, thus becoming the pioneer neurologist in the state of Minnesota, and when the Medical Department of the University of Minnesota was established he became professor of nervous and mental diseases. This chair he held for 25 years and at the time of his death was professor emeritus.

"September 11, 1884, he married Mabel Elizabeth Pratt, daughter of Albert M. Pratt of Bryan, Ohio. They had one daughter, Mrs. Fred Winston Long of Jacksonville, Fla.

"For ten years preceding the establishment of the State Board of Control Dr. Riggs was chairman of the State Lunacy Commission. He made repeated trips abroad for the purpose of medical study, and on one such journey was authorized by Governor Merriam to investigate the insane hospitals of Europe for the purpose of reproducing in Minnesota whatever was of value in European methods of care for the insane. He was also the first to interest himself actively in the necessity for detention wards in our larger cities, in the need of special care for the criminal insane and in the imperative necessity for a voluntary commitment law. The propaganda thus started by Dr. Riggs ultimately brought about all these needed reforms in the state. He also was the first one to use the intraspinous medication in the West.

"Dr. Riggs was a member of the American Neurological Association, the American Psychiatric Association, Minnesota Academy of Medicine, Minnesota Neurological Society, the Ramsey County Medical Society and the Central Neuropsychiatric Association.

"He was also a member of the Society of Colonial Wars and of the Sons of the Revolution, of which he had been president, and of the Minnesota Club.

"Dr. Riggs was a member of Plymouth Congregational Church, Minneapolis.

"He was a member of Summit Lodge and a Past Master, also member of Osman Temple and Paladin Commandery, and was a thirty-second degree Mason."

He is survived by his daughter in Jacksonville, Fla., two grandchildren, Mary Winston and Charles Riggs Long, and his nephew, Dr. Charles Riggs Ball of St. Paul.

Aloysius Julius Kaufman

(1875-1930)

Dr. A. J. Kaufman, a practising physician of Franklin, Minnesota, where he had practised for the last seven years, died suddenly March 23, 1930, at his home of heart disease at the age of 55 years.

Dr. Kaufman was born in Passau, Bavaria, Germany, and received his early education there. In 1886, he came to Newark, N. J., where he attended a seminary and then entered the University of Pennsylvania Medical School, from which he graduated in 1899. He practised in Colorado, Portland, Oregon, and then at Cheyenne Wells, Colorado, where he had a hospital for ten years. In 1923, he came to Franklin, where he also had a hospital.

He is survived by his wife, and two daughters, Anna and Margaret Kaufmann.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

CANCER OF THE BREAST. William Crawford White, M.D., F.A.C.S., Junior Surgeon to the Roosevelt Hospital, Consulting Surgeon to the New York Nursery and Child's Hospital. 221 pages. Illus. Price $3.00. New York: Harper & Brothers, 1930.

THE NORMAL DIET. W. D. Sansum, M.S., M.D., F.A.C.P., Director of the Potter Metabolic Clinic, Department of Metabolism, Santa Barbara Cottage Hospital. 3rd Ed. 134 pages. Illus. Price $1.50. St. Louis: The C. V. Mosby Company, 1930.

GONORRHEA AND KINDRED INFECTIONS. George Robertson Livermore, M.D., F.A.C.S., Professor of Urology, Medical Department, University of Tennessee, etc., and Edward Armin Schumann, A.B., M.D., F.A.C.S., Associate Professor of Obstetrics, University of Pennsylvania, etc. 257 pages; 66 illustrations. $5.00. D. Appleton and Co., New York and London, 1929.

As the authors state, this rather short but practical work is a presentation of their personal experience and conclusions regarding the diagnosis and treatment of gonorrhea. Comparatively few references are made to the literature on the subject. Particular attention is paid to pathology. The various means of diagnosis are carefully described. Methods of treatment are covered briefly, with, in most cases, an indication of the preferences of the authors. Since there is a wide divergence of opinion as to the choice of methods, naturally the reviewer does not agree with the authors in some details. Still the methods advocated are based on sound reasoning and wide experience and must carry weight on that basis.

The arrangement of the subject matter is practical, and the table of contents and the index aid also in making this an especially valuable reference book in a practitioner's office.

T. H. SWEETSER, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—REPRESENTATIVES—Desirable territory open for qualified men to call on doctors, dentists and pharmacists; immediate and permanent work. Lea & Febiger, S. Washington Square, Philadelphia, Pa.

WANTED—Physician for locum tenens, six weeks, starting July 1, Southern Minnesota town, 1,000 population. Address D-68, care MINNESOTA MEDICINE.

WANTED—X-ray and laboratory position. Competent young lady with three years' experience in X-ray and routine laboratory work, desires position in doctor's office or community hospital. Two years' nurse's training. Some knowledge of physical therapy. Best of references. Address D-68, care MINNESOTA MEDICINE.

WANTED—Summer work as medical technician desired. Have had some experience. References given if desired. Margaret Sutermesiter, 1121 Seventh St. S.E., Minneapolis, Minnesota.

FOR RENT—Best corner in city, occupied by doctors 40 years. Inquire J. E. Kinsella, Room 8, 601-5 St. Germain Street, St. Cloud, Minnesota.

POSITION WANTED in physician's office in or near Twin Cities by young woman physiotherapy technician. Can run urinalyses, make blood counts, also some *x*-ray. Eight years experience. Address D-65 care MINNESOTA MEDICINE.

SITUATION WANTED—*X*-Ray and laboratory technician, woman age 25, graduate of Swedish Hospital School of Technicians, Minneapolis. Have had three months experience in doctor's office. Can use typewriter. Address Box 222, Lamberton, Minnesota.

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline. Rent $25 a month. Inquire at dentist's office.

WANTED—Locum Tenens or assistantship by experienced physician, licensed in Minnesota. Address D-66, care MINNESOTA MEDICINE.

WANTED—Staff physician for Minnesota State Hospital. Either single or married man. Suitable accommodations for married man will be furnished with maintenance. Salary $150 monthly. Address D-64, care MINNESOTA MEDICINE.

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Black, Wm. ..... Mankato
Bomberger, C. B. ..... Mapleton
Butzer, J. A. ..... Mankato
Cosgriff, J. A. ..... Olivia
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Denman, A. V. ..... Mankato
Edwards, R. T. ..... Elysian
Eckstein, A. W. ..... Mankato
Franchere, F. W. ..... Lake Crystal
Fugina, G. R. ..... Mankato
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Holbrook, J. S. ..... Mankato
Howard, M. I. ..... Mankato
Huffington, H. L. ..... Mankato
Juliar, R. O. ..... St. Clair
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Farrish, R. C. ..... Sherburn
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Heimark, J. J. ..... Fairmont
Henderson, A. J. ..... Kiester
Hunt, F. N. ..... Fairmont
Hunt, R. C. ..... Fairmont
Hunte, A. F. ..... Truman
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Smith, L. G. ..... Montevideo
Stemsrud, A. A. ..... Dawson
Tangen, Geo. M. ..... Canby
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Regular meetings, January, April, and July.
Annual meeting, November.

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Swenson, Chas. ..... Braham

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Cooney, H. C. ..... Princeton

Cooney, H. C. ..... Princeton
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Holm, C. E. ..... Isle
Kooiker, Herman J. ..... Milaca
Peterson, A. A. ..... Mora
Phelps, A. G. ..... Minneapolis
Roadman, I. M. ..... Ponsford
Roehlke, A. B. ..... Elk River
Swennes, O. S. ..... Wahkon
Swenson, Chas. ..... Braham
Vik, M. ..... Onamia
Vrooman, F. E. ..... St. Francis

CHISAGO-PINE COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, May.

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Zeien, Thos. ..... North Branch

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Callahan, F. F. ..... Pokegama
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Aborn, W. H.....Hawley
Archibald, F. M.....Mahnomen

Bergheim, M. C.....Hawley
Bottolfson, B. T.....Moorbead
Carmen, J. E.....Detroit Lakes
Ellingson, A. R.....Detroit Lakes
Gosslee, G. L.....Moorhead
Hagen, O. J.....Moorhead
Heimark, J. H.....Moorhead
Humphrey, E. W.....Moorhead

Larsen, O. O.....Detroit Lakes
Rutledge, L. H.....Detroit Lakes
Simison, C. W.....Hawley
Scott, R. A.....Detroit Lakes
Thornby, H. J.....Moorhead
Thysell, F. A.....Moorhead

DODGE COUNTY MEDICAL SOCIETY

Annual meeting, September.

President
Baker, H. R.....Hayfield

Secretary
Bigelow, Cbarles E.....Dodge Center

Adams, R. T.....Mantorville
Affeldt, Daniel E.....Kasson
Baker, Harry R.....Hayfield
Bigelow, Charles E.....Dodge Center

Flores, O. T.....Dodge Center
Smith, Frank D.....Kasson

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, December.

President
Palmer, W. L.....Albert Lea

Secretary
Freligh, W. P.....Albert Lea

Branham, D. S.....Albert Lea
Burns, H. D.....Albert Lea

Butturff, C. R.....Freeborn
Calboun, F. W.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Albert Lea
Freligb, W. P.....Albert Lea
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gamble, R. M.....Albert Lea

Gullixson, A.....Albert Lea
Kaasa, L. J.....Albert Lea
Kamp, B. A.....Albert Lea
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Scbmitt, O. J.....Sterling, Colo.
Schultz, J. A.....Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Annual meeting, December.

President
Smith, M. W.....Red Wing

Secretary
Steffens, L. A.....Red Wing

Aanes, A. M.....Red Wing

Anderson, S. H.....Red Wing
Claydon, D. R.....Red Wing
Claydon, L. E.....Red Wing
Conley, Alva A.*.....Cannon Falls
Cremer, M. H.....Red Wing
Johnson, A. E.....Red Wing
Jones, A. W.....Red Wing

Liffrig, W. W.....Goodbue
McGuigan, H. T.....Red Wing
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Vaaler, T.....Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday of each month except June, July, August and September.
Annual meeting, first Monday in January.

President
Gardner, F. L.....Minneapolis

Secretary
Hansen, Erling W.....Minneapolis

Ahrens, R. S.....Minneapolis
Aling, C. P.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Almquist, H. E.....Minneapolis
Altnow, Hugo O.....Minneapolis
Anderson, A. E.....Minneapolis
Anderson, Arnold S.....St. Paul
Anderson, Arnt G.....Minneapolis
Anderson, David D.....Minneapolis
Anderson, Edward Dyer.....Minneapolis
Anderson, Ernest R.....Minneapolis
Anderson, Frank J.....Minneapolis
Anderson, J. K.....Minneapolis
Anderson, Silas C.....Minneapolis
Andrews, R. S.....Minneapolis
Annis, H. B.....Minneapolis
Arey, H. C.....Excelsior
Arnold, Duma C.....Minneapolis
Arvidson, C. G.....Minneapolis
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Avery, J. Fowler.....Minneapolis
Baken, Melvin P.....Minneapolis
Baker, Alfred T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Looe.....Minneapolis
Bakke, O. H.....Minneapolis
Barber, J. P.....Minneapolis
Barron, Moses.....Minneapolis
Barton, E. R.....Minneapolis
Bass, G. W.....Minneapolis
Baxter, S. H.....Minneapolis
Beard, Archie H.....Minneapolis
Beard, R. O.....Minneapolis
Bedford, E. W.....Minneapolis

Bell, E. T.....Minneapolis
Bell, J. W.....Minneapolis
Benedict, E. E.....Minneapolis
Benjamin, A. E.....Minneapolis
Benn, F. G.....Minneapolis
Berglund, Hilding.....Minneapolis
Bessesen, A. N. Sr.....Minneapolis
Bessesen, Al. N. Jr.....Minneapolis
Bessesen, Daniel H.....Minneapolis
Bessesen, W. A.....Minneapolis
Blake, Jas.....Minneapolis
Blaustone, Henry H.....Minneapolis
Blumenthal, Jacob.....Minneapolis
Bockman, M. W. H.....Minneapolis
Boe, A. M.....Minneapolis
Booth, A. E.....Minneapolis
Boquist, E. T. W.....Minneapolis
Boquist, Harold S.....Minneapolis
Boreen, C. A.....Minneapolis
Borgeson, E. J.....Minneapolis
Bouman, H. A.....Minneapolis
Boynton, Rutb.....Minneapolis
Bracken, H. M.....Claremont, Calif.
Bratrud, A. F.....Minneapolis
Brown, Edgar D.....Minneapolis
Brown, Edw. J.....Minneapolis
Bulkley, Kenneth.....Minneapolis
Butler, John.....Minneapolis
Buzzelle, L. K.....Minneapolis
Cable, M. L.....Minneapolis
Cabot, George S.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Callerstrom, G. W.....Minneapolis
Cameron, Isabell L.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, L. M.....Minneapolis
Campbell, Orwood J.....Minneapolis
Campbell, Robert.....Minneapolis
Cardle, Archibald E.....Minneapolis
Carey, Jas. B.....Minneapolis
Carlaw, C. M.....Minneapolis
Caron, Robert P.....Minneapolis
Cavanor, F. T.....Minneapolis

Chamberlain, H. E.....Minneapolis
Cheleen, S. J.....Minneapolis
Cberry, Cbas. H.....Minneapolis
Chesley, A. J.....Minneapolis
Clark, H. S.....Minneapolis
Cohen, S. S.....Oak Terrace
Condit, W. H.....Minneapolis
Cook, H. W.....Minneapolis
Cooperman, H. O.....Minneapolis
Corbett, J. Frank.....Minneapolis
Corniea, A. D.....Minneapolis
Cosman, E. O.....Minneapolis
Crafts, Leo M.....Minneapolis
Cranmer, Richard R.....Minneapolis
Creighton, Ralpb H.....Minneapolis
Crume, Geo. P.....Minneapolis
Curtin, John F.....Minneapolis
Cutts, George.....Minneapolis
Dady, Elmer E.....Minneapolis
Dahl, Elmer O.....Minneapolis
Dahl, John A.....Minneapolis
Daniel, Donald H.....Minneapolis
Daniel, Lewis M.....Minneapolis
Dart, Leslie O.....Minneapolis
Devereaux, T. G.....Wayzata
Dewar, J. E.....Minneapolis
Dezell, Earl A.....Minneapolis
Deziel, G.....Minneapolis
Diehl, Harold S.....Minneapolis
Diessner, H. D.....Minneapolis
Disen, C. F.....Minneapolis
Donaldson, C. A.....Mesa, Arizona
Dorge, Richard I.....Minneapolis
Dornblaser, H. B.....Minneapolis
Doxey, G. L.....Minneapolis
Doyle, L. O.....Minneapolis
Drake, C. R.....Minneapolis
Driesbach, N.....Minneapolis
Duff, Edwin R.....Minneapolis
Dumas, Alexander G.....Minneapolis
Dunlap, E. H.....Minneapolis
Dunn, Geo. R.....Minneapolis
Dunsmoor, F. A.....Minneapolis
Dutton, C. E.....Minneapolis

*Deceased

Dworsky, Samuel D.....Minneapolis
Egilsrud, Kristian.....Minneapolis
Ehrenberg, C. J.....Minneapolis
Eitel, Geo. D.....Minneapolis
Ehrlich, S. Paul.....Minneapolis
Ellison, David E.....Minneapolis
Erb, F. A.....Minneapolis
Erdmann, C. A.....Minneapolis
Ericson, J. G.....Minneapolis
Exley, E. W. F.....Minneapolis
Evans, Edward T.....Minneapolis
Fansler, W. A.....Minneapolis
Farabaugh, Charles L.....Minneapolis
Farr, R. E.....Minneapolis
Feeney, John M.....Minneapolis
Fenger, E.....Oak Terrace
Fink, Leo. W.....Minneapolis
Fink, Walter H.....Minneapolis
Fjeldstad, C. Alfred.....Minneapolis
Fleming, A. S.....Minneapolis
Foster, W. K.....Minneapolis
Fowler, L. H.....Minneapolis
Fox, John M.....Minneapolis
Fredericks, George M.....Minneapolis
Friedell, A.....Minneapolis
Funk, Victor K.....Oak Terrace
Gammell, J. H.....Minneapolis
Garand, J. H.....Dayton
Gardner, Edwin L.....Minneapolis
Geist, Emil S.....Minneapolis
Giere, E. O.....Minneapolis
Giere, J. C.....Minneapolis
Giere, Richard W.....Minneapolis
Giessler, Paul W.....Minneapolis
Gillis, F. L.....Minneapolis
Gingold, Benjamin A.....Minneapoils
Ginsberg, Harry.....Minneapolis
Girvin, Richard B.....Minneapolis
Goldberg, Isadore M.....Minneapolis
Gosin, D. F.....Minneapolis
Gratzek, Frank R.....Minneapolis
Grave, Floyd.....Minneapolis
Green, E. K.....Minneapolis
Greene, W. P.....Minneapolis
Greisheimer, Esther M.....Minneapolis
Gunderson, Nels A.....Minneapolis
Gustafson, H. T.....Minneapolis
Hacking, Frank H.....Minneapolis
Haddow, N. W.....Minneapolis
Hagen, G. L.....Minneapolis
Haggard, G. D.....Minneapolis
Hall, J. M.....Minneapolis
Hall, S. S.....Minneapolis
Hallberg, C. A.....Minneapolis
Hamel, Arnold L.....Minneapolis
Hamilton, A. S.....Minneapolis
Hamlin, George B.....Minneapolis
Hammond, A. J.....Minneapolis
Hannah, Hewitt B.....Minneapolis
Hansen, A. E.....Minneapolis
Hansen, Erling.....Minneapolis
Hansen, Olga S.....Minneapolis
Hanson, Harlow J.....Minneapolis
Hanson, H. V.....Minneapolis
Hare, E. R.....Minneapolis
Harrington, C. D.....Minneapolis
Harrington, F. E.....Minneapolis
Hartzell, Thos. B.....Minneapolis
Hastings, D. R.....Minneapolis
Hathaway, J. C.....Minneapolis
Haverfield, Addie R.....Minneapolis
Hawkinson, R. P.....Minneapolis
Hayes, J. M.....Minneapolis
Head, Douglas P.....Minneapolis
Head, G. D.....Minneapolis
Hearn, Wm. O.....Minneapolis
Hedback, A. E.....Minneapolis
Hedding, J. A.....Minneapolis
Heim, Russell E.....Minneapolis
Helk, H. H.....Minneapolis
Hendrickson, J. F.....Minneapolis
Henry, C. E.....Minneapolis
Henry, Myron O.....Minneapolis
Herbolsheimer, A. J.....Minneapolis
Herbst, Wm. P.....Minneapolis
Herman, Arthur L.....Minneapolis
Hiebert, J. P.....Minneapolis
Higbee, Paul A.....Minneapolis
Higgins, J. H.....Minneapolis
Hilbert Eunice.....Minneapolis
Hill, Eleanor J.....Minneapolis
Hirschfelder, A. D.....Minneapolis
Hirshfield, Adolph.....Minneapolis
Hirshfield, F. R.....Minneapolis
Hoaglund, A. W.....Minneapolis
Hobbs, C. A.....Minneapolis
Hodge, S. V.....Minneapolis
Hoiland, A. S.....Minneapolis
Holen, T.....Minneapolis
Holl, P. M.....Minneapolis
Holm, Geo. A.....Minneapolis
Holt, Wm. B.....Minneapolis
Howard, William H.....Minneapolis
Huenekens, E. J.....Minneapolis
Hughes, Louis D.....Minneapolis
Hurd, Annah.....Minneapolis
Hutchinson, Charles J.....Minneapolis
Hymes, Charles.....Minneapolis
Hynes, James.....Minneapolis
Hynes, John E.....Minneapolis
Irvine, H. G.....Minneapolis
Irwin, Alex F.....Minneapolis
Jackson, C. M.....Minneapolis
Jennings, Frank L.....Oak Terrace
Jennings, Mary H.....Minneapolis
Jensen, M. J.....Minneapolis
Johnson, A. E.....Minneapolis
Johnson, A. Elof.....Minneapolis
Johnson, James A.....Minneapolis
Johnson, Julius.....Minneapolis
Johnson, Nimrod A.....Minneapolis
Johnson, Norman.....Minneapolis
Johnson, Odin J.....Minneapolis
Johnson, R. A.....Minneapolis
Johnson, Selmer M.....Minneapolis
Jones, G. M.....Minneapolis
Jones, H. W.....Minneapolis
Jones, W. A.....Minneapolis
Jones, William R.....Minneapolis
Josewich, Alexander.....Minneapolis
Kelby, G. M.....Minneapolis
Kennedy, C. C.....Minneapolis
Kennedy, Jane F.....Minneapolis
Kennedy, R. Roy.....Minneapolis
Kibbe, O. A.....Minneapolis
King, E. A.....Minneapolis
King, Harry T.....Minneapolis
King, W. R.....Minneapolis
Kinsella, Thomas J.....Oak Terrace
Kistler, A. J.....Minneapolis
Kistler, C. M.....Minneapolis
Knight, Ralph T.....Minneapolis
Knight, Ray Roberts.....Minneapolis
Koch, John C.....Minneapolis
Kohler, Geo. A.....Minneapolis
Koller, Herman M.....Minneapolis
Koller, L. R.....Minneapolis
Kremer, Walter J.....Minneapolis
Kriedt, Daniel.....Minneapolis
Kucera, Frank J.....Hopkins
Kucera, Wm. J.....Minneapolis
Kusske, A. L.....New Ulm
Lajoie, John M.....Minneapolis
Lapierre, A. P.....Minneapolis
Lapierre, C. A.....Minneapolis
Lapierre, J. T.....Minneapolis
Larson, Clarence M.....Minneapolis
La Vake, R. T.....Minneapolis
Law, A. A.....Minneapolis
Lawrent, A. A.....Minneapolsi
Lazar, H. L.....Minneapolis
Leavitt, H. H.....Minneapolis
Lebowski, Joseph A.....Minneapolis
Lee, H. M.....Minneapolis
Leland, Harold R.....Minneapolis
Leland, M. M.....Minneapolis
Lemstrom, Jarl.....Minneapolis
Leonard, L. J.....Minneapolis
Levine, N. M.....Minneapolis
Lillehei, E. J.....Minneapolis
Lind, C. J.....Minneapolis
Lindquist, R. H.....Minneapolis
Linner, H. P.....Minneapolis
Linton, Wm. B.....Minneapolis
List, Walter E.....Minneapolis
Litchfield, John T.....Minneapolis
Litzenberg, J. C.....Minneapolis
Logefeil, Rudolph C.....Minneapolis
Long, Jesse.....Minneapolis
Loomis, E. A.....Minneapolis
Lundgren, A. C.....Minneapolis
Lundquist, E. F.....Minneapolis
Lynch, M. J.....Minneapolis
Lyng, John A.....Minneapolis
Lyon, E. P.....Minneapolis
Lyon, J. D.....Minneapolis
Lysne, Henry.....Minneapolis
McCarthy, Donald.....Minneapolis
McCartney, James S.....Minneapolis
McDaniel, Orianna.....Minneapolis
McEachran, A.....Minneapolis
McFarland, A. H.....Minneapolis
McGandy, R. F.....Minneapolis
McGeary, Geo. E.....Minneapolis
McIntyre, Geo.....Minneapolis
McKinley, C. A.....Minneapolis
McKinley, J. C.....Minneapolis
McKinney, F. S.....Minneapolis
McPheeters, H. O.....Minneapolis
MacDonald, A. E.....Minneapolis
MacDonald, D. A.....Minneapolis
MacDonald, Irving C.....Minneapolis
Mach, Frank B.....Minneapolis
Macnie, J. S.....Minneapolis
Macnie, John P.....Minneapolis
Maland, C. O.....Minneapolis
Mann, A. T.....Minneapolis
Marcley, W. J.....Minneapolis
Mariette, Ernest.....Oak Terrace
Mark, D. B.....Minneapolis
Martinson, C. J.....Wayzata
Matchan, Glen R.....Minneapolis
Matthews, Justus.....Minneapolis
Mattill, P. M.....Oak Terrace
Maxeiner, Stanley R.....Minneapolis
May, W. H.....Minneapolis
Merkert, Charles E.....Minneapolis
Merkert, George L.....Minneapolis
Meyer, E. L.....Minneapolis
Michael, J. C.....Minneapolis
Michelson, H. E.....Minneapolis
Moen, J. K. Jr.....Minneapolis
Moir, Wm. W.....Minneapolis
Monahan, R. H.....Minneapolis
Moorhead, M. B.....Minneapolis
Moren, Edwin.....Minneapolis
Moriarty, Cecile E.....Minneapolis
Morrison, A. W.....Minneapolis
Morton, H. McI.....Minneapolis
Murphy, Ignatius J.....Minneapolis
Myers, J. A.....Minneapolis
Nathanson, M. H.....Minneapolis
Nelson, C. P.....Minneapolis
Nelson, H. S.....Minneapolis
Nelson, O. E.....Minneapolis
Newhart, Horace.....Minneapolis
Nordin, G. T.....Minneapolis
Nordland, Martin.....Minneapolis
Noth, H. W.....Minneapolis
O'Brien, Wm. A.....Minneapolis
O'Donnell, J. E.....Minneapolis
Oberg, C. M.....Minneapolis
Olson, F. A.....Minneapolis
Olson, Olaf A.....Minneapolis
Olson, R. G.....Minneapolis
Owre, Oscar.....Minneapolis
Parks, A. H.....Minneapolis
Patterson, W. E.....Minneapolis
Paulsen, E. L.....Minneapolsi
Pearce, N. O.....Minneapolis
Pederson, Harold.....Minneapolis
Pederson, R. M.....Minneapolis
Peppard, T. A.....Minneapolis
Perry, Ralph St. John.....Minneapolis
Peters, R. M.....Minneapolis
Petersen, J. R.....Minneapolis
Petersen, Thorvald.....Minneapolis
Peterson, H. W.....Minneapolis
Peterson, O. H.....Minneapolis
Peterson, Willard C.....Minneapolis
Petit, L. J.....Minneapolis
Petter, Charles K.....Oak Terrace
Pettit, C. W.....Minneapolis
Pfunder, M. C.....Minneapolis
Phelps, Kenneth A.....Minneapolis
Platou, E. S.....Minneapolis
Pollard, D. W.....Minneapolis
Polzak, Jacob A.....Minneapolis
Poppe, Fred H.....Minneapolis
Porter, O. M.....Minneapolis
Potter, Edith L.....Minneapolis
Pratt, Fred J.....Minneapolis
Pratt, J. A.....Minneapolis
Preine, I. A.....Minneapolis
Prim, J. A.....Minneapolis
Proshek, Charles E.....Minneapolis
Quinby, Thomas F.....Minneapolis
Quist, H. W.....Minneapolis
Reed, Chas. A.....Minneapolis
Rees, S. P.....Minneapolis
Regnier, E. A.....Minneapolis
Reynolds, J. S.....Minneapolis
Richardson, Fred S.....Minneapolis
Richdorf, L. F.....Minneapolis
Ridgway, Florence.....Minneapolis
Rigler, Leo G.....Minneapolis
Rishmiller, J. H.....Minneapolis
Rizer, R. I.....Minneapolis
Roan, Carl M.....Minneapolis
Robb, Edwin F.....Minneapolis
Roberts, W. B.....Minneapolis
Robitshek, E. C.....Minneapolis
Rochford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Rodgers, C. L.....Minneapolis
Rosen, S.....Minneapolis
Rosenberg, George C.....Minneapolis
Rosenberg, Maurice N.....Minneapolis
Rosenwald, R. M.....Minneapolis
Rucker, Charles W.....Minneapolis
Rucker, William H.....Minneapolis
Rudell, Gustave.....Minneapolis
Sadler, William P.....Minneapolis
Sawatzky, Wm. A.....Minneapolis

Schaaf, F. H. K.....Minneapolis
Schaefer, Wesley G.....Minneapolis
Scheldrup, N. H.....Minneapolis
Schlutz, Frederic W.....Minneapolis
Schmidt, Geo. F.....Minneapolis
Schmitt, A. F.....Minneapolis
Schussler, Otto F.....Minneapolis
Schwartz, Virgil J.....Minneapolis
Schwyzer, Gustav.....Minneapolis
Schwyzer, Robert.....Minneapolis
Scott, F. H.....Minneapolis
Seashore, Gilbert.....Minneapolis
Seham, Max.....Minneapolis
Selleseth, Iver.....Minneapolis
Sessions, John C.....Minneapolis
Simons, Jalmar.....Minneapolis
Simpson, E. D.....Minneapolis
Simpson, J. D.....Minneapolis
Siperstein, D. M.....Minneapolis
Sivertson, Ivar.....Minneapolis
Slocumb, Maude S.....Minneapolis
Smith, A. M.....Minneapolis
Smith, Arthur E.....Minneapolis
Smith, Homer R.....Minneapolis
Smith, Norman S.....Minneapolis
Soderlind, Ragnar T.....Minneapolis
Solhaug, S. B.....Minneapolis
Spratt, C. N.....Minneapolis
Stelter, Lloyd A.....Minneapolis
Stewart, C. A.....Minneapolis
Stewart, R. I.....Minneapolis
Stomel, Joseph.....Minneapolis
Strauchauer, A. C.....Minneapolis
Strout, E. S.....Minneapolis
Strout, G. Elmer.....Minneapolis
Sturre, J. R.....Minneapolis
Sundt, M.....Minneapolis
Swanson, Cephas.....Minneapolis
Swanson, Roy E.....Minneapolis
Sweetser, H. B.....Minneapolis
Sweetser, H. B. Jr.....Minneapolis
Sweetser, Theodore.....Minneapolis
Sweitzer, S. E.....Minneapolis
Swendseen, Carl G.....Minneapolis
Taft, John O.....Minneapolis
Tanner, A. C.....Minneapolis
Taylor, Rood.....Minneapolis
Ternstrom, O. H.....Minneapolis
Thomas, Geo. E.....Minneapolis
Thomas, Geo. H.....Minneapolis
Thomas, Gilbert J.....Minneapolis
Tingdale, A. C.....Minneapolis
Trueman, H. S.....Minneapolis
Tunstead, Hugh J.....Minneapolis
Turnacliff, D. D.....Minneapolis
Tyrell, C. C.....Minneapolis
Ude, Walter H.....Minneapolis
Ulrich, Henry L.....Minneapolis
Undine, Clyde A.....Minneapolis
Urner, John A.....Minneapolis
Vik, A. Elliott.....Minneapolis
Vogtel, Melvin A.....Minneapolis
Voyer, Emile O.....Minneapolis
Wahlquist, Harold F.....Minneapolis
Waldron, Carl W.....Minneapolis
Wall, C. Ragnar.....Minneapolis
Wangensteen, O. H.....Minneapolis
Wanous, E. Z.....Minneapolis
Ward, A. W.....Minneapolis
Ward, Percy A.....Minneapolis
Warham, T. T.....Minneapolis
Watson, J. A.....Minneapolis
Webb, R. C.....Minneapolis
Weisman, S. A.....Minneapolis
Welles, H. J.....Minneapolis
Wethall, A. G.....Minneapolis
Wetherby, Macnider.....Minneapolis
Weum, T. Wm.....Minneapolis
White, S. Marx.....Minneapolis
White, Willard D.....Minneapolis
Widen, W. F.....Minneapolis
Wiese, H. F. B.....Minneapolis
Wilcox, Archa E.....Minneapolis
Wilder, Robert L.....Minneapolis
Wilken, Paul A.....Minneapolis
Willcutt, Clarence.....Minneapolis
Williams, H. L.....Minneapolis
Williams, Lowell E.....Oak Terrace
Williams, Robert.....Minneapolis
Witham, C. A.....Minneapolis
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wood, Douglas F.....Minneapolis
Woodworth, Elizabeth.....Minneapolis
Wright, C. B.....Minneapolis
Wright, Charles D'a.....Minneapolis
Wright, Franklin R.....Minneapolis
Wynne, H. M. N.....Minneapolis
Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis
Zanger, Isabelle M.....Minneapolis
Zaworski, E. A.....Minneapolis
Ziskin, Thos.....Minneapolis

HOUSTON-FILLMORE COUNTY MEDICAL SOCIETY

Regular meetings, not stated.
Annual meeting, October.

President
Williams, R. V.....Rushford
Secretary
Helland, J. W.....Spring Grove

Anderson, Norman E.....Harmony
Baldwin, A. E.....Houston
Beiswanger, R. H.....Wykoff
Belote, G. B.....Caledonia
Canfield, Wayne W.....Houston
Christianson, H. W.....Rochester
Davis, I. Grant.....Peterson
Drake, F. A.....Lanesboro
Eby, C. B.....Spring Valley
Edward, George.....Canton
Grinnell, W. B.....Preston
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Lannin, J. C.....Mabel
Lommen, A. P.....Lanesboro
Nass, H. A.....Mabel
Onsgard, L. K.....Houston
Palmer, R. N.....Lanesboro
Tierney, C. M.....Harmony
Williams, R. V.....Rushford
Woodruff, C. W.....Chatfield

KANDIYOHI-SWIFT COUNTY MEDICAL SOCIETY

Regular meetings, at call of President.
Annual meeting, December.

President
Behmler, F. W.....Appleton
Secretary
Scofield, C. L.....Benson

Anderson, R. E.....Willmar
Arnson, J. M.....Benson
Behmler, F. W.....Appleton
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Daignault, Oscar.....Benson
Dowswell, W. J.....Kerkhoven
Fredrickson, Alice.....Lake Lillian
Fredrickson, Guy.....Lake Lillian
Frisch, F. T.....Willmar
Giere, S. W.....Benson
Hodapp, R. J.....Willmar
Hutchinson, Henry.....New London
Jacobs, John C.....Willmar
Jensen, Herman H.....Atwater
Johnson, Hans.....Kerkhoven
Kaufmann, Wm.....Appleton
Rains, J. M.....Willmar
Scofield, C. L.....Benson
Thompson, Arthur.....Raymond

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, monthly.
Annual meeting, first Tuesday in October.

President
Hermanson, Peter E.....Hendricks
Secretary
Workman, H. M.....Tracy

Akester, Ward.....Marshall
Bossingham, O. N.....Lake Benton
Chunn, Stanley S.....Lake Wilson
Erickson, J. L.....Hendricks
Ford, B. C.....Marshall
Germo, Chas.....Balaton
Gray, F. D.....Marshall
Hermanson, Peter E.....Hendricks
Hoidale, A. D.....Tracy
Jacquot, G. L.....Marshall
Persons, C. E.....Marshall
Robertson, J. B.....Cottonwood
Sanderson, E. T.....Minneota
Thordarson, Theo.....Minneota
Vadheim, A. L.....Tyler
Valentine, W. H.....Tracy
Workman, H. M.....Tracy
Workman, W. G.....Tracy
Yaeger, W. W.....Ivanhoe

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, September.

President
Trutna, Thos. J.....Silver Lake
Secretary
Jensen, A. H.....Hutchinson

Clement, J. B.....Lester Prairie
Holm, H. H.....Glencoe
Hutterer, Edw. G.....Winsted
Jensen, A. H.....Hutchinson
Klima, W. W.....Stewart
Langhoff, A. H.....Glencoe
Remple, D. D.....Brownton
Sahr, W. G.....Hutchinson
Scholpp, O. W.....Hutchinson
Sheppard, Fred.....Hutchinson
Sheppard, P. E.....Hutchinson
Trutna, Thos. J.....Silver Lake

MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, May, August and October.
Annual meeting, December.

President
Dulude, S. S.....Dassel
Secretary
Danielson, K. A.....Litchfield

Brigham, Frank.....Watkins
Danielson, K. A.....Litchfield
Dulude, S. S.....Dassel
O'Connor, D. C.....Eden Valley
Peterson, A. C.....Dassel
Robertson, A. W.....Litchfield
Robertson, W. P.....Litchfield
Wilmot, H. E.....Litchfield

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of each month except July and August.
Annual meeting, last Thursday in November.

President
Havens, J. G. W.....Austin

Secretary
Sheedy, C. L.....Austin

Allen, A. W.....Austin
Allen, Chas. C.....Austin
Cobb, Willis F.....Lyle
Coleman, F. B.....Austin
Grise, W. B.....Austin
Havens, J. G. W.....Austin
Hegge, O. H.....Austin
Hegge, R. S.....Austin
Henslin, A. E.....Le Roy
Hertel, G. E.....Austin
Kreuzer, Titus C.....Austin
Leck, Clifford C.....Austin
Lewis, Chas. F.....Austin
Lommen, P. A.....Austin
McKenna, J. K.....Austin
Melzer, G. R.....Lyle
Mitchell, R. S.....Grand Meadow
Morrow, J. J.....Austin
Morse, M. P.....Le Roy
Rebman, E. C.....Austin
Sheedy, Chester L.....Austin
Torkelson, P. T.*.....Lyle

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, June, September and December.
Annual meeting, December.

President
Aitkens, H. B.....LeSueur Center

Secretary
Daniels, Jared W.....St. Peter

Aitkens, H. B.....LeSueur Center
Covell, W. W.....St. Peter
Daniels, Jared W.....St. Peter
Dodge, Frank A.....Le Sueur
Ericson, Swan.....Le Sueur
Freeman, George H.....St. Peter
Goforth, Clifford.....St. Peter
Hiniker, Peter J.....Le Sueur
Holtan, Theodore.....Waterville
Kerschbaumer, Louisa.....St. Peter
Lenander, Melvin E.....St. Peter
McKechnie, Wilfred.....St. Peter
McKeon, Joseph O.....Montgomery
Peterson, Magnus C.....St. Peter
Smith, Benjamin F.....Willmar
Stewart, N. W.....North Mankato
Strathern, Fred P.....St. Peter
Traxler, Felix J.....Henderson
Wolner, Oscar H.....St. Peter

OLMSTED COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday in April, June, September and December.
Annual meeting, November.

President
McKaig, C. B.....Pine Island

Secretary
Piper, M. C.....Rochester

Abbott, W. D.....Rochester
Adams, S. F.....Rochester
Adson, A. W.....Rochester
Allan, F. N.....Rochester
Allen, E. V.....Rochester
Allen, R. W.....Rochester
Allen, W. A.....Rochester
Alvarez, W. C.....Rochester
Amberg, Samuel.....Rochester
Anderson, C. M.....Rochester
Anderson, E. W.....Rochester
Anderson, M. J.....Rochester
Anderson, R. M.....Rochester
Anderson, R. S.....Rochester
Bain, C. G.....Rochester
Balfour, D. C.....Rochester
Ball, R. G.....Rochester
Bannick, E. G.....Rochester
Barborka, C. J.....Rochester
Bargen, J. A.....Rochester
Barker, N. W.....Rochester
Barnes, A. R.....Rochester
Bartels, E. C.....Rochester
Bayard, H. F.....Rochester
Beaver, M. G.....Rochester
Benedict, W. L.....Rochester
Berkman, D. M.....Rochester
Berkman, J. M.....Rochester
Binger, N. W.....Rochester
Birkeland, I. W.....Rochester
Bliss, T. I.....Rochester
Boeck, W. C.....Rochester
Boesel, R. J.....Rochester
Bonesteel, H. T. S.....Rochester
Bonta, M. B.....Rochester
Boothby, W. M.....Rochester
Bowing, H. H.....Rochester
Braasch, W. F.....Rochester
Bradley, J. W.....Rochester
Broders, A. C.....Rochester
Brown, A. E.....Rochester
Brown, C. B.....Rochester
Brown, G. E.....Rochester
Brown, P. W.....Rochester
Bruner, J. M.....Rochester
Brunsting, L. A.....Rochester
Buie, L. A.....Rochester
Bumpus, H. C.....Rochester
Bumpus, L. D.....Rochester
Burke, Charles F.....Rochester
Cameron, M. C. Jr.....Rochester
Camp, J. D.....Rochester
Carmichael, H. T.....Rochester
Cathcart, Edward.....Rochester
Chapman, C. B.....Rochester
Childrey, J. H.....Rochester
Christensen, E. E.....Rochester
Chumley, C. L.....Rochester
Coakley, L. P.....Rochester
Coleman, J. H.....Rochester
Collins, Donald C.....Rochester
Comfort, M. W.....Rochester
Conner, H. M.....Rochester
Cooke, H. H.....Rochester
Cooper, F. G.....Rochester
Copeland, M. M.....Rochester
Corr, W. P.....Rochester
Counseller, V. S.....Rochester
Craig, W. McK.....Rochester
Crenshaw, J. L.....Rochester
Crewe, J. E.....Rochester
Daniels, H. A.....Rochester
Daniels, L. E.....Rochester
Davis, A. C.....Rochester
Davison, H. L.....Rochester
Dawley, W. A.....Rochester
Dean, B. F. Jr.....Rochester
DeCarle, D. W.....Rochester
Decker, W. J.....Rochester
Desjardins, A. U.....Rochester
Ditmore, D. C.....Rochester
Dixon, C. F.....Rochester
Dixon, R. K.....Rochester
Dolder, F. C.....Eyota
Donald, Joseph M.....Rochester
Down, H. I.....Rochester
Doyle, J. B.....Rochester
Drips, D. G.....Rochester
Droegemueller, E. H.....Rochester
Dunlap, H. F.....Rochester
Emmons, W. F.....Rochester
Eusterman, G. B.....Rochester
Evarts, A. B.....Rochester
Farrell, H. J.....Rochester
Faust, L. S.....Rochester
Fauster, J. U. Jr.....Rochester
Fawcett, C. E.....Stewartville
Fehland, H. R.....Rochester
Figi, F. A.....Rochester
Finney, W. P., Jr.....Rochester
Finney, Mrs. W. P. (Theodora Wheeler).....Rochester
FitzGibbon, T. G.....Rochester
Ford, F. A.....Rochester
Fortin, H. J.....Rochester
Foster, W. C.....Rochester
Fox, Ben.....Rochester
Fricke, R. E.....Rochester
Fulcher, O. H.....Rochester
Gaarde, F. W.....Rochester
Ghormley, Ralph K.....Rochester
Ghrist, D. G.....Rochester
Giffin, H. Z.....Rochester
Goeckerman, W. H.....Rochester
Good, L. P.....Rochester
Gorder, A. C.....Rochester
Graham, A. S.....Rochester
Gray, H. K.....Rochester
Greeley, Horace Jr.....Rochester
Greene, C. H.....Rochester
Habein, H. C.....Rochester
Haines, S. F.....Rochester
Hallenbeck, D. F.....Rochester
Hand, J. R.....Rochester
Hane, R. L.....Rochester
Hanlon, F. R.....Rochester
Hardeman, D. R. Jr.....Rochester
Harrington, S. W.....Rochester
Hartman, H. R.....Rochester
Hartwell, S. W.....Muskegon, Michigan
Hartzell, J. B.....Rochester
Havens, F. Z.....Rochester
Hazeltine, M. E.....Rochester
Heck, F. J.....Rochester
Hefke, H. W.....Rochester
Heimdal, C. O.....Rochester
Helmholz, H. F.....Rochester
Hempstead, B. E.....Rochester
Hench, P. S.....Rochester
Henderson, M. S.....Rochester
Heyerdale, O. C.....Rochester
Hill, F. C.....Rochester
Hillyard, L. V.....Rochester
Holland, W. W.....Rochester
Hookey, J. A.....Rochester
Horton, B. T.....Rochester
Hunt, V. C.....Rochester
Hurt, A. S. Jr.....Rochester
Hyde, Theodore L.....Rochester
Johnson, H. W. E.....Rochester
Johnson, W. R.....Rochester
Jordan, F. M.....Rochester
Joyce, G. L.....Stewartville
Joyce, G. T.....Rochester
Judd, E. S.....Rochester
Keith, H. M.....Rochester
Keith, N. M.....Rochester
Kennedy, R. L. J.....Rochester
Kepler, E. J.....Rochester
Kernohan, J. W.....Rochester
Kilbourne, A. F.....Rochester
Kilgore, G. L.....Rochester
Kintner, A. R.....Rochester
Kirklin, B. R.....Rochester
Lacy, N. E.....Rochester
Larson, Lawrence M.....Rochester
Learmonth, J. R.....Rochester
Leddy, E. T.....Rochester
Lemon, W. S.....Rochester
Lillie, H. I.....Rochester
Lillie, W. I.....Rochester
Lineberry, E. D.....Rochester
Lochead, D. C.....Rochester
Logan, A. H.....Rochester
Loney, W. R. R.....Rochester
Loughery, H. B.....Rochester
Love, J. G.....Rochester
Lundy, J. S.....Rochester
Magath, T. B.....Rochester
Magee, H. R.....Rochester
Mahorner, H. R.....Rochester
Major, S. G.....Rochester
Malmgren, G. E.....Rochester
Margolis, H. M.....Rochester
Marshall, J. M.....Rochester

*Deceased

Mason, J. B.....Rochester
Masson, D. M.....Rochester
Masson, J. C.....Rochester
Mattson, Hamline.....Rochester
Mayo, C. H.....Rochester
Mayo, C. W.....Rochester
Mayo, J. G.....Rochester
Mayo, W. J.....Rochester
Maytum, C. K.....Rochester
McBride, W. P.....Rochester
McCarty, R. B.....Rochester
McCaughan, J. M.....Rochester
McCuskey, C. F.....Rochester
McKaig, C. B.....Pine Island
Metheny, David.....Rochester
Meyerding, H. W.....Rochester
Mills, R. G.....Rochester
Moench, L. M.....Rochester
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Mohardt, J. H.....Rochester
Montgomery, Hamilton.....Rochester
Moore, A. B.....Rochester
Morehead, D. E.....Rochester
Morgan, Sherburn F.....Rochester
Morton, H. B.....Rochester
Mroz, R. J.....Rochester
Mueller, S. C.....Rochester
Mulholland, S. W.....Rochester
Murphy, G. T.....Rochester
Mussey, R. D.....Rochester
Nabers, L. W.....Rochester
Nelson, W. L.....Rochester
Nesbit, M. E.....Rochester
New, G. B.....Rochester
Nickel, A. A. C.....Rochester
Norment, W. B.....Rochester
Norton, M. W.....Rochester
Nunn, L. L.....Rochester
Nutting, R. E.....Rochester
O'Leary, P. A.....Rochester
Ochsner, H. C.....Rochester
Offutt, S. R.....Rochester
Ohlinger, L. B.....Chicago, Illinois
Olson, E. A.....Pine Island
Palmer, B. M.....Rochester
Parker, H. L.....Rochester
Partsch, W. T.....Rochester
Pemberton, J. deJ.....Rochester
Peterson, J. A.....Rochester
Pfeffer, T. J.....Rochester
Piper, M. C.....Rochester
Plummer, H. S.....Rochester
Plummer, W. A.....Rochester
Pollock, L. W.....Rochester
Powelson, H. C.....Rochester
Prangen, A. D.....Rochester
Prescott, M. U.....Rochester
Prickman, L. E.....Rochester
Priestley, J. T.....Rochester
Priestley, J. B.....Rochester
Puestow, C. B.....Rochester
Radtke, H. P.....Rochester
Randall, L. M.....Rochester
Rankin, F. W.....Rochester
Rentschler, E. B.....Rochester
Reuter, M. J.....Rochester
Rieniets, J. H.....Rochester
Rivers, A. B.....Rochester
Robertson, H. E. .....Rochester
Rogers, J. C. T.....Rochester
Rosenow, E. C.....Rochester
Rowntree, L. G.....Rochester
Ruedemann, E.....Rochester
Rynearson, E. H.....Rochester
Sanford, A. H.....Rochester
Schacht, F. W.....Rochester
Schaefer, Joseph F.....Rochester
Scott, D. E.....Rochester
Shane, James H.....Rochester
Sheldon, W. D.....Rochester
Smith, F. L.....Rochester
Smith, H. L.....Rochester
Smith, L. M.....Rochester
Smith, N. D.....Rochester
Smith, W. M.....Rochester
Snell, A. M.....Rochester
Spannuth, J. R.....Rochester
Stacy, L. J.....Rochester
Stark, W. B.....Rochester
Steven, G.....Byron
Stevens, R. B.....Rochester
Steward, J. A.....Rochester
Stewart, C. C. Jr.....Rochester
Stuhler, L. G.....Rochester
Sussex, L. T.....Rochester
Sutherland, C. G.....Rochester
Sutton, L. F.....Mazeppa
Swart, H. A.....Rochester
Thomas, L. C.....Rochester
Thompson, F. R.....Rochester
Thompson, G. J.....Rochester
Thompson, H. L.....Rochester
Tinkess, D. E.....Rochester
Vanzant, F. R.....Rochester
Verbrugghen, A. H. P. E.....Rochester
Vinson, P. P.....Rochester
Von Lackum, W. H.....Rochester
Watkins, C. H.....Rochester
Wagener, H. P.....Rochester
Waldron, G. W.....Rochester
Walker, M. A.....Rochester
Walters, Waltman.....Rochester
Weber, H. M.....Rochester
Webster, William W.....Rochester
Weir, J. F.....Rochester
Wellbrock, W. L. A.....Rochester
White, J. H.....Rochester
Wilbur, D. L.....Rochester
Wilhelmj, C. M.....Rochester
Williams, H. L. Jr.....Rochester
Willius, F. A.....Rochester
Wilson, L. B.....Rochester
Woltman, H. W.....Rochester
Wood, H. G.....Rochester
Wright, W. C.....Rochester
Yesko, S. A.....Rochester
Zillessen, Frederick O.....Rochester
Zinn, Charles J.....Rochester
Ziegler, L. H.....Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Otter Tail, Wilkin, Grant and Douglas Counties.
Regular meetings, second Wednesday in January, April, July and October.
Annual meeting, second Wednesday in October.

President
Satersmoen, Theo.....Fergus Falls

Secretary
Heiberg, E. A.....Fergus Falls

Baker, A. C.....Fergus Falls
Boysen, P.....Pelican Rapids
Brabec, F. J.....Perham
Brabec, P. F.....Perham
Broker, W. S.....Battle Lake
Burnap, W. L.....Fergus Falls
Drought, W. W.....Fergus Falls
Esser, J.....Perham
Estrem, C. O.....Fergus Falls
Freeborn, J. A.....Fergus Falls
Hand, W. R.....Elbow Lake
Haskell, A. D.....Alexandria
Heiberg, E. A.....Fergus Falls
Houkom, B. .....Fergus Falls
Johnson, O. V.....Fergus Falls
Kemp, M. W.....Fergus Falls
Kierland, P. E.....Alexandria
Kittelson, T. N.....Fergus Falls
Lee, W. A.....Fergus Falls
Leibold, H. H.....Parkers Prairie
Lewis, A. J.....Henning
Love, F. A.....Carlos
Meckstroth, C. W.....Brandon
Naegeli, F..... Fergus Falls
Nelson, O. N.....Battle Lake
Nelson, W. I.....Underwood
Otto, H. C.....Frazee
Parson, L. R.....Elbow Lake
Patterson, W. L.....Fergus Falls
Paulson, T. S.....Fergus Falls
Platt, F. B.....Battle Lake
Satersmoen, T.....Pelican Rapids
Tanquist, E. J.....Alexandria
Vail, J. B.....Henning
Wray, W. E.....Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of month except June, July and August.
Annual meeting, last Monday of January.

President
Schuldt, F. C.....St. Paul

Secretary
Schulze, A. G.....St. Paul

Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Alberts, Max W.....St. Paul
Alden, J. F.....St. Paul
Aldes, Harry.....St. Paul
Alexander, F. H.....St. Paul
Allen, Mason.....St. Paul
Arends, A. L.....Wright
Armstrong, J. M.....St. Paul
Arnquist, A. S.....St. Paul
Aurelius, J. R.....St. Paul
Bacon, Donald K.....St. Paul
Bacon, Knox.....San Diego, Cal.
Bacon, L. C.....St. Paul
Balcome, F. E.....St. Paul
Ball, C. R.....St. Paul
Barry, L. W.....St. Paul
Barsness, Nellie.....St. Paul
Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Bell, C. C.....St. Paul
Benepe, L. M.*.....St. Paul
Bennion, P. H.....St. Paul
Bentley, Norman P.....St. Paul
Berrisford, P. D.....St. Paul
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bock, R. A.....St. Paul
Boeckmann, Egil.....St. Paul
Bohland, E. H.....St. Paul
Bole, R. S.....St. Paul
Borg, J. F.....St. Paul
Bouma, L. R.....St. Paul
Brand, G. D.....St. Paul
Bray, E. R.....St. Paul
Brimhall, J. B.....St. Paul
Brodie, Walter D.....St. Paul
Brooks, D. F.....St. Paul
Brooks, G. F.....St. Paul
Brown, J. C.....St. Paul
Brown, S. E.....St. Paul
Burch, F. E.....St. Paul
Burfiend, G. H.....St. Paul
Burns, F. W.....St. Paul
Burns, R. M.....St. Paul
Burton, Carl G.....St. Paul
Busher, H.....St. Paul
Caldwell, James P.....St. Paul
Caldwell, Kenneth S.....St. Paul
Cameron, J. A.....St. Paul
Campbell, J. E.....So. St. Paul
Cannon, Harry.....St. Paul
Carroll, Wm. C.....St. Paul
Carter, Fred G.....St. Paul
Chatterton, C. C.....St. Paul
Christiansen, A.....St. Paul
Christison, J. T.....St. Paul
Clark, T. C.....Minneapolis
Cobb, S. G.....St. Paul
Colby, Woodard.....St. Paul
Cole, Wallace H.....St. Paul
Colvin, A. R.....St. Paul
Comstock, A. E.....St. Paul
Conner, William H.....Minneapolis
Conner, C. E.....St. Paul
Cook, Paul B.*.....St. Paul
Countryman, Roger S.....St. Paul
Cowern, E. W.....North St. Paul
Critchfield, L. R.....St. Paul
Crump, J. W.....St. Paul
Culligan, John M.....St. Paul
Culligan, Leo. C.....St. Paul
Dack, L. G.....St. Paul
Darling, J. B.....St. Paul
Daugherty, E. B.....St. Paul
Daugherty, L. E.....St. Paul
Davis, Herbert.....St. Paul
Davis, William.....St. Paul
Dedolph, Karl.....St. Paul
Delougherty, J.....St. Paul
Derauf, B. I.....St. Paul
Dickson, Thomas H. Jr.....St. Paul
Dittman, Geo. C.....St. Paul

*Deceased

Dohm, A. J. ..... St. Paul
Donohue, P. F. ..... St. Paul
Drake, Carl B. ..... St. Paul
Dunn, J. N. ..... St. Paul
Dunne, Gerald P. ..... St. Paul
Earl, George A. ..... St. Paul
Earl, Robert O. ..... St. Paul
Edlund, G. ..... St. Paul
Ely, O. S. ..... So. St. Paul
Emerson, E. C. ..... St. Paul
Endress, E. K. ..... St. Paul
Engberg, E. J. ..... St. Paul
Ernest, G. C. ..... St. Paul
Eshelby, E. C. ..... St. Paul
Fahey, E. W. ..... St. Paul
Ferguson, J. C. ..... St. Paul
Flagstad, A. E. ..... St. Paul
Fogarty, Charles W. ..... St. Paul
Foley, F. E. B. ..... St. Paul
Fortney, A. C. ..... St. Paul
Freeman, C. D. ..... St. Paul
Fulton, J. F. ..... St. Paul
Gager, E. C. ..... St. Paul
Garbrecht, Arthur ..... St. Paul
Gardiner, D. G. ..... St. Paul
Gardner, Walter P. ..... St. Paul
Geer, Everett K. ..... St. Paul
Gehlen, J. N. ..... St. Paul
Geist, George A. ..... St. Paul
Ghent, C. Harry ..... St. Paul
Ghent, M. M. ..... St. Paul
Gilfillan, J. S. ..... St. Paul
Ginsberg, Wm. ..... St. Paul
Goltz, E. V. ..... St. Paul
Grant, H. W. ..... St. Paul
Gratzek, Thomas ..... St. Paul
Gruenhagen, Arnold P. ..... St. Paul
Hagaman, Geo. K. ..... St. Paul
Hall, A. R. ..... St. Paul
Hall, Henry H. ..... St. Paul
Halper, Philip ..... St. Paul
Hammes, E. M. ..... St. Paul
Hammond, J. F. ..... St. Paul
Harmon, G. E. ..... St. Paul
Hartfiel, Wm. F. ..... St. Paul
Hartley, E. C. ..... St. Paul
Hauser, Victor ..... St. Paul
Hawkins, V. J. ..... St. Paul
Heath, A. C. ..... St. Paul
Heck, Wm. W. ..... St. Paul
Hedenstrom, Frank G. ..... St. Paul
Hengstler, W. H. ..... St. Paul
Hensel, C. N. ..... St. Paul
Herrmann, Edgar T. ..... St. Paul
Hesselgrave, S. S. ..... St. Paul
Hilger, A. W. ..... St. Paul
Hilger, D. D. ..... St. Paul
Hilger, L. A. ..... St. Paul
Hochfilzer, J. J. ..... St. Paul
Hoff, Alfred ..... St. Paul
Hoffman, Max H. ..... St. Paul
Holcomb, J. T. ..... St. Paul
Holcomb, O. W. ..... St. Paul
Holt, John E. ..... St. Paul
Howard, W. S. ..... St. Paul
Hullsiek, H. E. ..... St. Paul
Hullsiek, Richard ..... St. Paul
Hultkrans, Joel C. ..... St. Paul
Hunt, H. E. ..... St. Paul
Ide, A. W. ..... St. Paul
Ikeda, Kano ..... St. Paul

Johnson, Asa M. ..... St. Paul
Johnson, Hartland C. ..... St. Paul
Johnson, Ray G. ..... St. Paul
Johnson, T. H. ..... St. Paul
Jones, D. C. ..... St. Paul
Jones, E. M. ..... St. Paul
Kadesky, David ..... St. Paul
Kamman, Gordon R. ..... St. Paul
Kannary, E. L. ..... St. Paul
Kelly, John V. ..... St. Paul
Kelly, Paul H. ..... St. Paul
Kennedy, W. A. ..... St. Paul
Kenny, H. F. ..... St. Paul
Kesting, Herman ..... St. Paul
King, George L. ..... St. Paul
King, Z. P. ..... St. Paul
Kistler, A. S. ..... St. Paul
Klein, H. N. ..... St. Paul
Knauff, M. K. ..... St. Paul
Kvitrud, G. ..... St. Paul
Langenderfer, F. V. ..... St. Paul
Larsen, C. L. ..... St. Paul
Lax, Morris H. ..... St. Paul
Leahy, B. ..... St. Paul
Leavenworth, Richard O. ..... St. Paul
Leitch, Archibald ..... St. Paul
Leonard, Gilbert J. ..... St. Paul
Lepak, J. A. ..... St. Paul
Lerche, William ..... Cable, Wis.
Levin, Bert ..... St. Paul
Lewis, W. W. ..... St. Paul
Lick, C. L. ..... St. Paul
Little, W. J. ..... St. Paul
Lowe, Earl R. ..... So. St. Paul
Lowe, Thomas A. ..... So. St. Paul
Lundholm, A. M. ..... St. Paul
McBeath, Ewing C. ..... New York City
McCarthy, W. R. ..... St. Paul
McClanahan, J. H. ..... White Bear
McClanahan, T. S. ..... White Bear
McCloud, C. N. ..... St. Paul
McLaren, Jeanette M. ..... St. Paul
McNevin, C. F. ..... St. Paul
Martineau, J. L. ..... St. Paul
Meyerding, E. A. ..... St. Paul
Moga, John A. ..... St. Paul
Mogilner, S. N. ..... St. Paul
Molander, H. A. ..... St. Paul
Moquin, Marie A. ..... St. Paul
Morrissey, F. B. ..... St. Paul
Mortenson, N. G. ..... St. Paul
Moynihan, T. J. ..... St. Paul
Muller, R. Theo. ..... St. Paul
Myers, Thos. ..... St. Paul
Naegeli, A. E. ..... St. Paul
Neher, F. H. ..... St. Paul
Nelson, L. A. ..... St. Paul
Nippert, H. T. ..... St. Paul
Nordin, Charles G. ..... St. Paul
Norris, Edgar H. ..... St. Paul
Nye, Katherine A. ..... St. Paul
Nye, Lillian ..... St. Paul
O'Brien, H. J. ..... St. Paul
O'Connor, J. P. ..... St. Paul
O'Connor, L. J. ..... St. Paul
Oerting, Harry ..... St. Paul
Ogden, Warner ..... St. Paul
Ohage, Justus ..... St. Paul
Ohage, Justus Jr. ..... St. Paul
Olson, Chas. A. ..... St. Paul
Ostergren, E. W. ..... St. Paul

Pedersen, A. H. ..... St. Paul
Penny, L. E. ..... St. Paul
Perry, C. G. ..... St. Paul
Peterson, V. N. ..... St. Paul
Plondke, F. J. ..... St. Paul
Prendergast, H. J. ..... St. Paul
Ramsey, W. R. ..... St. Paul
Richards, E. T. F. ..... St. Paul
Richardson, Harold E. ..... St. Paul
Riggs, C. E.* ..... St. Paul
Ritchie, H. P. ..... St. Paul
Rogers, J. T. ..... St. Paul
Rosenholtz, Burton ..... St. Paul
Rosenthal, Robert ..... St. Paul
Rothrock, J. L. ..... St. Paul
Rothschild, H. J. ..... St. Paul
Roy, Philemon ..... St. Paul
Ruhberg, George N. ..... St. Paul
Rutherford, W. C. ..... St. Paul
Ryan, John J. ..... St. Paul
Ryan, Mark E. ..... St. Paul
Satterlund, Victor ..... St. Paul
Savage, F. J. ..... St. Paul
Schoch, R. B. ..... St. Paul
Schons, E. ..... St. Paul
Schuldt, F. C. ..... St. Paul
Schulze, Albert G. ..... St. Paul
Schwyzer, Arnold ..... St. Paul
Senkler, G. E. ..... St. Paul
Setzer, H. J. ..... St. Paul
Shannon, W. Ray ..... St. Paul
Shellman, John L. ..... St. Paul
Shillington, M. A. ..... St. Paul
Simon, B. F. ..... St. Paul
Skinner, H. O. ..... St. Paul
Snyder, G. W. ..... St. Paul
Sohlberg, Olof ..... St. Paul
Souster, B. B. ..... St. Paul
Sprafka, J. M. ..... St. Paul
Sterner, E. G. ..... St. Paul
Sterner, O. W. ..... St. Paul
Stevens, F. A. ..... Lake Elmo
Stewart, Alexander ..... St. Paul
Stierle, Adolph ..... St. Paul
Stinnette, S. E. ..... St. Paul
Stolpestad, H. L. ..... St. Paul
Swanson, Edwin O. ..... St. Paul
Swanson, John A. ..... St. Paul
Swendson, J. J. ..... St. Paul
Taylor, H. L. ..... St. Paul
Teisberg, C. B. ..... St. Paul
Tiber, L. J. ..... St. Paul
Tregilgas, H. R. ..... So. St. Paul
Van Slyke, C. A. ..... St. Paul
Vonder Weyer, William ..... St. Paul
Waas, Charles W. ..... St. Paul
Walker, R. E. ..... St. Paul
Warnock, R. W. ..... St. Paul
Warren, E. L. ..... St. Paul
Welch, M. C. ..... St. Paul
Werner, O. S. ..... St. Paul
Wheller, M. W. ..... St. Paul
Whitacre, J. C. ..... St. Paul
Whitcomb, E. H. ..... St. Paul
White, J. S. ..... St. Paul
Whitmore, Frank ..... St. Paul
Williams, Clayton ..... St. Paul
Williamson, Geo. A. ..... St. Paul
Winnick, J. B. ..... St. Paul
Wold, K. C. ..... St. Paul
Zimmermann, H. B. ..... St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Marshall, Polk, Roseau, Pennington, Red Lake, Norman and Mahnomen Counties.

Regular meetings, April, December and August.
Annual meeting, December.

President
Adkins, C. M. ..... Grygla

Secretary
Oppegaard, C. L. ..... Crookston

Adkins, C. M. ..... Grygla
Anderson, W. S. ..... Minneapolis
Bernard, B. C. ..... Thief River Falls
Bertleson, O. L. ..... Crookston
Biedermann, Jacob ..... Thief River Falls
Blegen, H. M. ..... Warren
Bowers, J. T. ..... Thief River Falls
Bratrud, O. Edw. ..... Warren
Bratrud, Theodor ..... Warren
Brosseau, J. E. ..... Argyle
Brown, L. L. ..... Crookston
Button, A. J. ..... Greenbush
Delmore, J. L. ..... Roseau

Dunlop, Alex. H. ..... Crookston
Edstrom, Henry ..... Crookston
Engstrand, O. J. ..... Warren
Froehlich, H. W. ..... Thief River Falls
Griffin, P. J. ..... Fertile
Hanson, M. ..... Ada
Henney, W. H. ..... McIntosh
Hodgson, H. H. ..... Crookston
Hollands, W. H. ..... Fisher
Holmes, W. B. ..... Ada
Holte, Halvor ..... Crookston
Kahala, Arthur ..... Crookston
Kirk, G. P. ..... East Grand Forks
Larson, Arnold L. ..... Duluth
Leitch, Neil M. ..... Warroad
Locken, O. E. ..... Crookston
Lynde, Orrin ..... Thief River Falls
Mellby, O. F. ..... Thief River Falls
Mercil, Wm. F. ..... Crookston
Morley, G. A. ..... Crookston

Nelson, H. E. ..... Crookston
Norman, J. F. ..... Crookston
Ohnstad, J. L. ..... McIntosh
Oppegaard, C. L. ..... Crookston
Oppegaard, M. O. ..... Crookston
Overend, K. V. ..... Hallock
Paradis, W. G. ..... Crookston
Rasmusson, C. C. ..... Fertile
Roy, J. A. ..... Red Lake Falls
Sather, Allen ..... Fosston
Shaleen, A. W. ..... Hallock
Shedlov, A. ..... Fosston
Shelland, J. T. ..... Ada
Stratte, J. J. ..... Hallock
Stuurmanns, S. H. ..... Erskine
Swedenberg, A. W. ..... Thief River Falls
Turnbull, Robert ..... Fosston
Watson, N. M. ..... Red Lake Falls
Wattam, G. S. ..... Warren
Wiltrout, I. Geo. ..... Oslo

*Deceased

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, at call of President.
Annual meeting, May.

President
Fritsche, L. A.....New Ulm

Secretary
Meierding, Wm. A.....New Ulm

Abraham, Arden L.....Gibbon
Dubbe, F. H.....New Ulm
Fauth, Karl J.....Gaylord
Fritsche, Albert.....New Ulm
Fritsche, L. A.....New Ulm
Gibbons, F. C.....Comfrey
Goblirsch, A. P.....Sleepy Eye
Hammermeister, Theo.....New Ulm
Hovde, Rolf.....Winthrop
Jamieson, Earl.....Walnut Grove
Just, Herman.....Lafayette
Kiefer, M. A.....Sleepy Eye
Kolset, Carl D.....Sanborn
Lindahl, Merlyn J.....Winthrop
Meierding, Wm. A.....New Ulm
Pederson, O. J.....Hanska
Peterson, R. A.....Vesta
Reineke, G. F.....New Ulm
Rothenburg, J. C.....Springfield
Saffert, Cornelius.....New Ulm
Scherer, Roland G.....Morgan
Schoch, J. L.....New Ulm
Seifert, Otto J.....New Ulm
Shrader, J. S.....Springfield
Vogel, J. H.....New Ulm
Weiser, Geo. B.....New Ulm
Wellcome, J. W. B.....Sleepy Eye
Wieckman, F. H.....Sleepy Eye
Wohlrabe, Clarence F.....Springfield
Wohlrabe, Edwin J.....Springfield

RICE COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, December.

President
Murdoch, J. M.....Faribault

Secretary
Plonske, C. J.....Faribault

Babcock, F. M.....Northfield
Backe, Edmund.....Kenyon
Beede, Ethel R.....Faribault
Davis, F. U.....Faribault
Dungay, Neil S.....Northfield
Francis, D. W.....Morristown
Hanson, A. M.....Faribault
Haessly, S. B.....Faribault
Haynes, A. L.....Faribault
Huxley, F. R.....Faribault
Kanne, C. W.....Faribault
Lende, Norman.....Faribault
Lexa, F. J.....Lonsdale
McBroom, D. E.....Cambridge
Mayland, M. L.....Faribault
Meyer, P. F.....Faribault
Moses, J.....Northfield
Murdoch, J. M.....Faribault
Neseth, O. S.....Kenyon
Nickerson, W. S.....Faribault
Plonske, C. J.....Faribault
Robilliard, C. M.....Faribault
Robilliard, W. H.....Faribault
Rumpf, C. W.....Faribault
Rumpf, W. H.....Faribault
Smith, P. A.....Faribault
Stewart, Gwendolyn.....Faribault
Thorson, O. P.....Northfield
Traeger, C. A.....Faribault
Warren, F. S.....Faribault
Wilson, Warren.....Northfield
Wilson, W. E.....Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

St. Louis, Lake, Cook, and Carlton Counties.
Regular meetings, second Thursday each month.
Annual meeting, second Thursday, October.

President
Elias, F. J.....Duluth

Secretary
Fischer, M. McC.....Duluth

Abbott, Wm. P.....Duluth
Adams, B. S.....Hibbing
Alexander, C. E.....Duluth
Arminen, K. V.....Duluth
Armstrong, E. L.....Duluth
Athens, A. G.....Duluth
Ayres, G. T.....Ely
Bagley, W. R.....Duluth
Bakkila, H. E.....Duluth
Bardon, Richard.....Duluth
Barney, L. A.....Duluth
Berdez, G. L.....Duluth
Bergquist, K. E.....Duluth
Bianco, A. J.....Duluth
Birkland, O. N.....Hibbing
Blacklock, S. S.....Hibbing
Blakely, C. C.....Barnum
Boman, P. G.....Duluth
Boyer, S. H.....Duluth
Braden, A. J.....Duluth
Braverman, N. J.....Duluth
Bray, C. W.....Biwabik
Bullen, F. W.....Hibbing
Burns, R. L.....Two Harbors
Cantwell, W. F.....International Falls
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
Cheney, E. L.....Duluth
Christensen, E. P.....Two Harbors
Clark, F. F.....Duluth
Clement, T. G.....Duluth
Collins, A. N.....Duluth
Collins, H. C.....Duluth
Cosgrove, J. H.....Duluth
Coventry, W. A.....Duluth
Davis, B. F.....Duluth
Doolittle, L. E.....Duluth
Drenning, F. C.....Duluth
Eckman, P. F.....Duluth
Ekblad, J. W.....Duluth
Eklund, W. J.....Duluth
Elias, F. J.....Duluth
Eppard, R. M.....Cloquet
Estrem, T. A.....Hibbing
Fawcett, Keith R.....Duluth
Ferriera, G. J.....Duluth
Fischer, M. McC.....Duluth
Fleming, James.....Cloquet
Forbes, R. S.....Duluth
French, H. S.....Duluth
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Giroux, A. A.....Duluth
Gowan, L. R.....Duluth
Graham, David.....Duluth
Graham, R. D.....Duluth
Graham, Robert.....Duluth
Graves, W. N.....Duluth
Grawn, F. A.....Duluth
Hall, A. E.....Virginia
Haney, C. L.....Duluth
Hansen, R.....Buhl
Harris, C. N.....Chisholm
Hatch, W. E.....Duluth
Hathaway, S. J.....Proctor
Hayes, M. F.....Nashwauk
Haynes, M. H.....Duluth
Heimark, O. E.....Duluth
Hilding, Anderson C.....Duluth
Hill, F. E.....Duluth
Hirschboeck, F. J.....Duluth
Hirschfield, M. S.....Duluth
Holderman, J. W.....Duluth
Jacobson, C.....Chisholm
Jensen, T. J.....Duluth
Kerlan, Milton.....Philadelphia, Pa.
Keyes, C. R.....Duluth
Kiesling, I. H.....Nashwauk
Klein, Harry.....Duluth
Kliman, F. E.....Duluth
Knapp, F. N.....Duluth
Kohlbry, C. O.....Duluth
Kraft, Peter.....Duluth
Krantz, C. I.....Duluth
Kuth, J. R.....Duluth
Laird, A. T.....Nopeming
Lamont, John C.....Nopeming
Lenont, C. B.....Virginia
Lepak, F. J.....Duluth
Litman, S. N.....Duluth
Loofbourrow, E. H.....Keewatin
Lum, C. E.....Duluth
McCarty, P. D.....Ely
McComb, C. F.....Duluth
McCoy, Mary.....Duluth
McDaniel, S. P.....Mountain Iron
McDonald, A. L.....Duluth
McGiffert, E. N.....Duluth
McHaffie, O. L.....Duluth
McNutt, J. R.....Minneapolis
MacFarlane, P. H.....Chisholm
MacRae, G. C.....Duluth
Magie, W. H.....Duluth
Magney, F. H.....Duluth
Manley, J. R.....Duluth
Martin, E. T.....Duluth
Martin, W. C.....Duluth
Mayne, R. M.....Duluth
Merriman, L. L.....Duluth
Moe, R. J.....Duluth
Moe, Thomas.....Moose Lake
Monroe, P. B.....Soudan
Mooney, Leo P.....Marble
More, C. W.....Eveleth
Morsman, L. W.....Hibbing
Morss, C. R.....Zumbrota
Murray, D. D.....Duluth
Nelson, E. H.....Chisholm
Nelson, R. L.....Duluth
Nicholson, M. A.....Duluth
Olson, Albert E.....Duluth
Oredson, O. A.....Duluth
Parker, O. W.....Ely
Pennie, D. F.....Duluth
Perley, A. E.....Philadelphia, Pa.
Power, J. E.....Duluth
Raadquist, C. S.....Hibbing
Raiter, F. W. S.....Cloquet
Raiter, R. F.....Cloquet
Rapp, E. W.....Duluth
Robinson, J. M.....Duluth
Rood, D. C.....Duluth
Rowe, O. W.....Duluth
Rowles, E. K.....Coleraine
Ruby, F. McK.....Hibbing
Rudie, P. S.....Duluth
Ryan, W. J.....Duluth
St. Clair, G. G.....Ft. Snelling
Scherer, C. A.....Duluth
Schroder, C. H.....Duluth
Seashore, D. E.....Duluth
Shapiro, E. Z.....Duluth
Shaw, A. W.....Buhl
Sinamark, Andrew.....Hibbing
Slyfield, F. F.....Duluth
Smith, C. M.....Duluth
Smith, E. K.....Duluth
Spicer, F. W.....Duluth
Strathern, M. L.....Gilbert
Strobel, W. G.....Duluth
Stuart, A. B.....Cloquet
Sukeforth, L. A.....Duluth
Sutherland, H. N.....Ely
Swenson, A. O.....Duluth
Taylor, C. W.....Duluth
Tibbetts, M. H.....Duluth
Tilderquist, D. L.....Duluth
Tuohy, E. L.....Duluth
Urberg, S. E.....Duluth
Vercellini, C. E.....Duluth
Vivian, R. S.....Hibbing
Walker, A. E.....Duluth
Webber, E. E.....Duluth
Weber, M. L.....Duluth
Webster, H. E.*.....Duluth
Weirick, H. R.....Hibbing
Wheeler, D. W.....Duluth
Wilkinson, Stella.....Duluth
Winter, J. A.....Duluth
Young, T. O.....Duluth
Young, V. A.....Duluth
Zlatovski, M. L.....Duluth

*Deceased

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, every two months in Winter—Every month in Summer.
Annual meeting, in July.

President
Westerman, F. C.—Montgomery

Secretary
Simons, B. H.—Chaska

Bohland, F. J.—Belle Plaine
Buck, F. H.—Shakopee
Cervenka, C. F.—New Prague
Eklund, E. J.—Norwood
Emmerson, W .S.—Mayer
Fisher, H. P.—Shakopee
Fisher, P. M.—Shakopee
Halgren, H. A.—Watertown
Hebeisen, M. B.—Carver
Henriksen, H. G.—Elko
Juergens, H. M.—Belle Plaine
Kolars, J. J.—Le Sueur Center
McKeon, James—St. Paul
Maertz, W. F.—New Prague
Nagel, H. D.—Waconia
Novak, E. E.—New Prague
Olson, C. J.—Belle Plaine
Ormond, D.—Waconia
Phillips, W. H.—Jordan
Reiter, H. W.—Shakopee
Schneider, H. A.—Jordan
Simons, B. H.—Chaska
Westerman, A. E.—Montgomery
Westerman, F. C.—Montgomery
Wunder, H. E.—Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Pipestone, Rock, Murray, Nobles, Cottonwood and Jackson Counties.
Annual meeting, November.

President
Patterson, W. E.—Westbrook

Secretary
McKeown, E. G.—Pipestone

Arnold, E. W.—Adrian
Basinger, H. P.—Windom
Basinger, Harvey R.—Mountain Lake
Benjamin, McBroom—Jasper
Benjamin, W. G.—Pipestone
Bofenkamp, F. W.—Luverne
Bong, J. H.—Jasper
Brown, A. H.—Pipestone
Chadbourne, A. G.—Heron Lake
Cress, P. J.—Ellsworth
DeBoer, H.—Edgerton
Ditmeier, L. M. G.—Jasper
Dolan, C. P.—Worthington
Doms, H. C.—Slayton
Dudley, J. H.—Windom
Golden, C. M.—Tyler
Halloran, Walter—Jackson
Hilger, J. M.—Iona
Hitchings, W. S.—Lakefield
Johnson, Ellsworth—Rochester
Kelling, Louis F.—Lakefield
Kendahl, A. M.—Jaspar
Kilbride, E. A.—Worthington
Leebens, J. H.—Lismore
Lowe, Thos.—Pipestone
McCrea, James—Fulda
McKeown, E. G.—Pipestone
Maitland, D. P.—Jackson
Manson, F. M.—Worthington
Mork, B. O.—Worthington
Nusbaum, D. H.—Jackson
Patterson, W. E.—Westbrook
Piper, Wm. A.—Mountain Lake
Portmann, W. C.—Jackson
Rose, J. T.—Lakefield
Schutz, Elmer S.—Windom
Sherman, C. L.—Luverne
Slater, S. A.—Worthington
Smallwood, J. T.—Worthington
Sogge, L.—Windom
Stanley, C. R.—Worthington
Taylor, Wm. J.—Pipestone
Thorsen, E. O.—Luverne
Tiedemann, E. J.—Adrian
Tofte, Josephine—Dawson
Waller, J. D.—Wilmont
Watson, Sydney—Worthington
Williams, A. B.—St. Paul
Williams, Leon A.—Slayton
Wright, C. O.—Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of each month.
Annual meeting, third Thursday of April.

President
Meyers, A. A.—Melrose

Secretary
McDowell, Jno. P.—St. Cloud

Beuning, J. B.—Albany
Boehm, J. C.—St. Cloud
Brigham, C. F.—St. Cloud
Buscher, Julius—St. Cloud
Clark, H. B.—St. Cloud
Du Bois, J. A.—Sauk Center
Du Bois, J. F.—Sauk Center
Engstrom, Geo. F.—Belgrade
Fleming, T. N.—St. Cloud
Freeman, W. L.—St. Cloud
Friesleben, Wm.—Sauk Rapids
Gelz, Jno. J.—St. Cloud
Goehrs, H. W.—St. Cloud
Haberman, E.—Osakis
Halenbeck, Philip Luther—St. Cloud
Hemstead, Werner—St. Cloud
Holdridge, Geo.—Foley
Johnson, Walford—Sauk Center
Jones, R. N.—St. Cloud
Kern, M. J.—St. Cloud
Kingsbury, E. M.—Clearwater
Kohler, D. W.—St. Joseph
Koop, S. H.—Richmond
Kuhlman, Aug.—Melrose
Lewis, C. B.—St. Cloud
Libert, J. N.—St. Cloud
McDowell, Jno. P.—St. Cloud
McKibben, H. E.—St. Cloud
Mahowald, A.—Albany
Meyer, A. A.—Melrose
Moynihan, A. F.—Sauk Center
Myre, C. R.—Paynesville
Rathbun, A. M.—Rice
Rathbun, C. A.—St. Cloud
Richards, W. B.—St. Cloud
Ridgway, Alexander—Belgrade
Rumpf, Wm. H., Jr.—St. Cloud
Schatz, F. J.—St. Cloud
Sherwood, Geo. E.—Kimball
Stangl, Fred—St. Cloud
Stangl, Philip E.—St. Cloud
Sutton, C. S.—St. Cloud
Sweetman, R. H.—Sauk Center
Townsend, De Wayne—Brooten
Wenner, W. T.—St. Cloud
Zachman, A. H.—Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, odd months, second Tuesday.
Annual meeting, November.

President
Nelson, Ernest J.—Owatonna

Secretary
Hart, Alfred B.—Owatonna

Ertel, E. Q.—Ellendale
Gault, C. C.—Owatonna
Hart, Alfred B.—Owatonna
McIntyre, John A.—Owatonna
Melby, Benedik—Blooming Prairie
Nelson, Ernest J.—Owatonna
Senn, E. W.—Owatonna
Smersh, J. F.—Owatonna
Stewart, A. B.—Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching,
Hubbard, Itasca and Beltrami Counties.
Regular meetings, Spring, Fall, Summer.
Annual meeting, January.

President
Badeaux, G. I.—Brainerd

Secretary
Kumm, F. F.—Wadena

Agnew, Allen T.—International Falls
Allen, F. H.—Staples
Badeaux, G. I.—Brainerd
Beise, R. A.—Brainerd
Borgerson, A. H.—Hewitt
Burns, Herbert A.—Ah-gwah-ching
Christie, G. R.—Long Prairie
Christie, R. L.—Long Prairie
Corrigan, J. E.—Spooner
Craig, C. C.—International Falls
Davis, Thayer C.—Wadena
Davis, L. Thomas—Wadena
Forrest, C. G.—Clearbrook
Frost, Harry T.—Wadena
Gaalaas, A. F.—Wadena
Garlock, A. V.—Bemidji
Garlock, D. H.—Bemidji
Ghostley, Mary C.—Puposky
Grogan, J. S.—Wadena
Grose, Fredk. N.—Clarissa
Groschup, Theo. P.—Bemidji
Hawkinson, L. F.—Brainerd
Hawkinson, J. P.—Crosby
Healy, R. T.—Pierz
Holst, C. F.—Little Falls
Holst, J. B.—Little Falls
House, Z. E.—Cass Lake
Houston, C. A.—Park Rapids
Jacobson, David J.—Blackduck
Johnson, E. W.—Bemidji
Kelly, B. W.—Aitkin
Kenyon, Paul—Wadena
Kumm, Frederick F.—Wadena
Larson, L. M.—Oak Terrace
Laughlin, J. T.—Grey Eagle
McHugh, Roderica F.—Aitkin
Marcum, E. H.—Bemidji
Miller, W. A.—New York Mills
Mower, Ralph E.—Bemidji
Nelson, Nesmith—Brainerd
Ortman, John W.—Pierz
Osburn, Burt F.—International Falls

Parrott, B. W.....Long Prairie
Pierce, Chas. H.....Wadena
Roberts, L. M.....Little Falls
Shannon, S. S.....Crosby
Simons, Edwin J.....Swanville
Smith, B. A.....Crosby
Smith, E. H.....Bemidji
Strader, E. L.....Deerwood
Thabes, John Alois, Jr.....Brainerd
Thabes, J. A., Sr.....Brainerd
Trimbo, Jos. H.....Menahga
Van Valkenberg, B. F.....Long Prairie
Van Valkenberg, F. W.....Long Prairie
Watson, A. M.....Royalton
Watson, John D.....Holdingford
Will, W. W.....Bertha

WABASHA COUNTY MEDICAL SOCIETY

Annual meeting, first Thursday after first Monday in July.

President
Frost, Russell H.....Wabasha

Secretary
Wilson, W. F.....Lake City

Bayley, E. C.....Lake City
Bowers, H. E.....Lake City
Cochrane, W. J.....Lake City
Collins, J. S.....Wabasha
Dempsey, D. P.....Kellogg
Fleischhauer, D. S.....Wabasha
Frost, R. H.....Wabasha
Radabaugh, R. C.....Hastings
Replogle, W. H.....Wabasha
Slocumb, J. A.....Plainview
Stryker, W. B.....Plainview
Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Annual meeting, December.

President
O'Hara, J. J.....Janesville

Secretary
Saliterman, B. I.....Janesville

Bernstein, Wm. C.....New Richland
Gallagher, B. J.....Waseca
Hagen, H. O.....New Richland
Leopard, B. A.....New Richland
McIntire, H. M.....Waseca
O'Hara, J. J.....Janesville
Saliterman, B. I.....Janesville
Swartwood, F. A.....Waseca
Swenson, O. J.....Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of month.
Annual meeting, second Tuesday in December.

President
Humphrey, W. R.....Stillwater

Secretary
Boleyn, E. S.....Stillwater

Boleyn, E. S.....Stillwater

Combacker, L. C.....Fergus Falls
Haines, J. H.....Stillwater
Hewson, Wilfred J.....Stillwater
Humphrey, W. R.....Stillwater
Josewski, R. J.....Stillwater
Kalinoff, D.....Stillwater
Poirier, J. A.....Forest Lake
Sherman, Carnot H.....Philadelphia, Pa.
Strand, E.....Bayport
Stuhr, J. W.....Stillwater
Thompson, V. C.....Marine-on-St. Croix
Von Meier, H.....Stillwater

WATONWAN COUNTY MEDICAL SOCIETY

Regular meetings, on call
Annual meeting, December.

President
Bregel, F. L.....St. James

Secretary
Grimes, H. B.....Madelia

Bergman, Oscar B.....St. James
Bregel, Fred L.....St. James
Grimes, Henry B.....Madelia
Hagen, Olie E.....Butterfield
Haynes, B. H.....Butterfield
McCarthy, W. J.....Madelia
Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Traverse, Pope and Stevens Counties.
Regular meetings, October, January and June.
Annual meeting, October.

President
Linde, H.....Cyrus

Secretary
Bolsta, Chas.....Ortonville

Arneson, A. I.....Starbuck
Bergen, Otto.....Clinton
Bolsta, Charles.....Ortonville
Caine, Chas. E.....Morris
Christianson, C. R.....Starbuck
Cumming, J. F.....Morris
Doleman, N. F.....Tintah
Eberlin, A. E.....Glenwood
Elsey, J. R.....Glenwood
Ewing, C. F.....Wheaton
Fitzgerald, E. T.....Morris
Gibbon, L. L.....Lowry
Giesen, A. F.....Starbuck
Judge, W. T.....Graceville
Karn, B. R.....Ortonville
Leland, J. T.....Herman
Leuty, Amos.....Morris
Lindberg, A. L.....Wheaton
Linde, H.....Cyrus
McIver, B. A.....Lowry
O'Donnell, D. M.....Ortonville
Oliver, C. I.....Graceville
Pierson, C. M.....Wheaton
Ransom, M. L.....Hancock
Shelver, H. J.....Ortonville
Weir, J. D.....Browns Valley

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, January, April, July and October.
Annual meeting, January.

President
Walker, G. H.....Winona

Secretary
Steiner, I. W.....Winona

Benoit, F. T.....Winona
Clay, F. H.....St. Charles
Fetter, Mary.....Winona
Heise, W. F. C.....Winona
Keyes, E. D.....Winona
Keyes, J. D.....Winona
Lichtenstein, Hans.....Winona
Lindsay, W. V.....Winona
McDonell, C. H.....Winona
McLaughlin, E. M.....Winona
Mattison, P. A.....Winona
Meinert, A. E.....Winona
Nauth, W. W.....Winona
Neumann, C. A.....Lewiston
Page, R. L.....St. Charles
Pritchard, D. B.....Winona
Risser, E. D.....Winona
Robbins, C. P.....Winona
Satterlie, H. W.....Lewiston
Schaefer, Samuel.....Winona
Steiner, I. W.....Winona
Tweedy, G. J.....Winona
Walker, G. H.....Winona
Wilson, R. H.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, October.

President
Norris, Geo. H.....Annandale

Secretary
Catlin, J. J.....Buffalo

Catlin, John J.....Buffalo

Ellison, Frank E.....Monticello
Freed, O. J. R.....Cokato
Harriman, L.....Howard Lake
Johnson, V. P.....Delano
Klaveness, E.....St. Paul
Lee, J. L.....Watertown
Norris, G. H.....Annandale
Peterson, O. L.....Cokato
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roholt, C. L.....Waverly
Rousseau, V.....Maple Lake
Swezey, B. F.....Buffalo

ALPHABETICAL ROSTER

Aanes, A. M.....Red Wing
Abbott, Walter D.....Rochester
Abbott, Wm. P.....Duluth
Aborn, W. H.....Hawley
Abraham, Arden L.....Gibbon
Adams, B. S.....Hibbing
Adams, R. C.....Bird Island
Adams, R. T.....Mantorville
Adams, S. Franklin.....Rochester
Adkins, C. M.....Grygla
Adson, A. W.....Rochester
Affeldt, Daniel E.....Kasson
Agnew, Allen T.....International Falls
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Ahrens, R. S.....Minneapolis
Aitkens, H. B.....LeSueur Center
Akester, Ward.....Marshall
Alberts, Max W.....St. Paul
Alden, J. F.....St. Paul
Aldes, Harry.....St. Paul
Aldrich, F. H.....Belview
Alexander, Clifford E.....Duluth
Alexander, F. H.....St. Paul
Aling, C. P.....Minneapolis
Allan, Frank N.....Rochester
Allen, A. W.....Austin
Allen, Chas. C.....Austin
Allen, Edgar V.....Rochester
Allen, F. H.....Staples
Allen, H. W.....Minneapolis
Allen, Mason.....St. Paul
Allen, Roy W.....Rochester
Allen, W. A.....Rochester
Allison, R. G.....Minneapolis
Almquist, H. E.....Minneapolis
Altnow, Hugo O.....Minneapolis
Alvarez, Walter C.....Rochester
Amberg, Samuel.....Rochester
Anderson, A. E.....Minneapolis
Anderson, Arnt G.....Minneapolis
Anderson, Arnold S.....St. Paul
Anderson, C. M.....Rochester
Anderson, David D.....Minneapolis
Anderson, E. W.....Rochester
Anderson, Edward D.....Minneapolis
Anderson, Ernest R.....Minneapoils
Anderson, Frank J.....Minneapolis
Anderson, J. K.....Minneapolis
Anderson, Mark J.....Rochester
Anderson, Norman E.....Harmony
Anderson, R. E.....Willmar
Anderson, Reuben M.....Rochester
Anderson, Richard S.....Rochester
Anderson, S. H.....Red Wing
Anderson, Silas C.....Minneapolis
Anderson, W. S.....Minneapolis
Andrews, J. W.....Mankato
Andrews, R. N.....Mankato
Andrews, R. S.....Minneapolis
Annis, H. B.....Minneapolis
Archibald, Frank M.....Mahnomen
Arends, A. L.....Wright
Arey, H. C.....Excelsior
Arminen, K. V.....Duluth
Armstrong, E. L.....Duluth
Armstrong, J. M.....St. Paul
Arneson, A. I.....Starbuck
Arnold, Duma C.....Minneapolis
Arnold, E. W.....Adrian
Arnquist, A. S.....St. Paul
Arnson, J. M.....Benson
Arvidson, C. G.....Minneapolis
Athens, A. G.....Duluth
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Aurelius, J. Richards.....St. Paul
Avery, J. Fowler.....Minneapolis
Ayres, G. T.....Ely

Babcock, F. M.....Northfield
Backe, Edmund.....Kenyon
Bacon, Donald K.....San Diego, Cal.
Bacon, Knox.....St. Paul
Bacon, L. C.....St. Paul
Bacon, R. S.....Montevideo
Badeaux, G. I.....Brainerd
Bagley, W. R.....Duluth
Bailey, H. B.....Ceylon
Bain, Charles G.....Rochester
Baken, Melvin P.....Minneapolis
Baker, A. C.....Fergus Falls
Baker, Alfred T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Harry.....Hayfield
Baker, Looe.....Minneapolis
Bakke, O. H.....Minneapolis
Bakkila, Henry.....Duluth

*Deceased

Balcome, F. E.....St. Paul
Baldwin, A. E.....Houston
Balfour, D. C.....Rochester
Ball, C. R.....St. Paul
Ball, R. G.....Rochester
Bannick, Edwin G.....Rochester
Barber, J. P.....Minneapolis
Barborka, C. J.....Rochester
Bardon, Richard.....Duluth
Bargen, J. Arnold.....Rochester
Barker, Nelson W.....Rochester
Barnes, A. R.....Rochester
Barney, L. A.....Duluth
Barron, Moses.....Minneapolis
Barry, L. W.....St. Paul
Barsness, Nellie.....St. Paul
Bartels, E. C.....Rochester
Barton, E. R.....Minneapolis
Basinger, H. P.....Windom
Basinger, Harvey R.....Mountain Lake
Bass, G. W.....Minneapolis
Bayard, Harry F.....Rochester
Baxter, S. H.....Minneapolis
Bayley, E. C.....Lake City
Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Beard, Archie H.....Minneapolis
Beard, R. O.....Minneapolis
Beaver, Meredith G.....Rochester
Bedford, E. W.....Minneapolis
Beede, Ethel R.....Faribault
Behmler, Fred W.....Appleton
Beise, R. A.....Brainerd
Beiswanger, R. H.....Wykoff
Bell, C. C.....St. Paul
Bell, E. T.....Minneapolis
Bell, J. W.....Minneapolis
Belote, G. B.....Caledonia
Benedict, E. E.....Minneapolis
Benedict, W. L.....Rochester
Benepe, L. M.*.....St. Paul
Benham, E. W.....Mankato
Benjamin, A. E.....Minneapolis
Benjamin, M. B.....Jasper
Benjamin, W. G.....Pipestone
Benn, F. G.....Minneapolis
Bennion, P. H.....St. Paul
Benoit, F. T.....Winona
Bentley, Norman P.....St. Paul
Berdez, G. L.....Duluth
Bergan, Otto.....Clinton
Bergh, L. N.....Montevideo
Bergheim, M. C.....Hawley
Berglund, Hilding.....Minneapolis
Bergman, O. B.....St. James
Bergquist, K. E.....Duluth
Berkman, D. M.....Rochester
Berkman, John M.....Rochester
Bernard, B. C.....Thief River Falls
Bernstein, Wm. C.....New Richland
Berrisford, Paul D.....St. Paul
Bertelson, O. L.....Crookston
Bessesen, A. N., Sr.....Minneapolis
Bessesen, Al. N., Jr.....Minneapolis
Bessesen, Daniel H.....Minneapolis
Bessesen, W. A.....Minneapolis
Beuning, J. B.....Albany
Bianco, A. J.....Duluth
Biedermann, Jacob.....Thief River Falls
Bigelow, C. E.....Dodge Center
Binger, H. E.....St. Paul
Binger, Melvin W.....Rochester
Birkeland, Ivar W.....Rochester
Birkland, O. N.....Hibbing
Birnberg, T. L.....St. Paul
Black, Wm.....Mankato
Blacklock, S. S.....Hibbing
Blake, Jas.....Hopkins
Blakely, C. C.....Barnum
Blanchard, H. G.....Fairmont
Blaustone, Henry H.....Minneapolis
Blegen, H. M.....Warren
Bliss, Theodore L.....Rochester
Blumenthal, Jacob.....Minneapolis
Bock, R. A.....St. Paul
Bockman, M. W. H.....Minneapolis
Boe, A. M.....Minneapolis
Boeck, William C.....Rochester
Boeckmann, Egil.....St. Paul
Boehm, J. C.....St. Cloud
Boesel, R. J.....Rochester
Bofenkamp, F. W.....Luverne
Bohland, E. H.....St. Paul
Bohland, F. J.....Belle Plaine
Bohling, B. S.....Sandstone
Bole, R. S.....St. Paul
Boleyn, E. S.....Stillwater
Bolsta, Chas.....Ortonville
Boman, P. G.....Duluth
Bomberger, C. B.....Mapleton

Bonesteel, Henry T. S.....Rochester
Bong, J. H.....Jasper
Bonta, M. B.....Rochester
Booth, A. E.....Minneapolis
Boothby, Wm.....Rochester
Boquist, E. T. W.....Minneapolis
Boquist, Harold S.....Minneapolis
Boreen, C. A.....Minneapolis
Borg, Joseph F.....St. Paul
Borgerson, A. H.....Hewitt
Borgeson, Egbert J.....Minneapolis
Bossingham, O. N.....Lake Benton
Bottolfson, B. T.....Moorhead
Bouma, L. R.....St. Paul
Bouman, H. A.....Minneapolis
Bowers, H. E.....Lake City
Bowers, J. T.....Thief River Falls
Bowing, H. H.....Rochester
Boyer, S. H.....Duluth
Boynton, Ruth.....Minneapolis
Boysen, H.....Welcome
Boysen, Peter.....Pelican Rapids
Braasch, Wm. F.....Rochester
Brabec, F. J.....Perham
Brabec, P. F.....Perham
Bracken, H. M.....Claremont, Calif.
Braden, A. J.....Duluth
Bradley, J. W.....Rochester
Brand, G. D.....St. Paul
Brand, W. A.....Redwood Falls
Branham, D. S.....Albert Lea
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Bratrud, A. F.....Minneapolis
Bratrud, O. Edward.....Warren
Bratrud, Theodor.....Warren
Braverman, N. J.....Duluth
Bray, C. W.....Biwabik
Bray, E. R.....St. Paul
Bregel, Fred L.....St. James
Brigham, C. F.....St. Cloud
Brigham, Frank.....Watkins
Brimhall, J. B.....St. Paul
Broders, A. C.....Rochester
Brodie, Walter D.....St. Paul
Broker, W. S.....Battle Lake
Brooks, D. F.....St. Paul
Brooks, G. F.....St. Paul
Brosseau, J. E.....Argyle
Brown, A. E.....Rochester
Brown, A. H.....Pipestone
Brown, C. B.....Rochester
Brown, Edgar D.....Minneapolis
Brown, Edw. J.....Minneapolis
Brown, G. E.....Rochester
Brown, John C.....St. Paul
Brown, Lyle L.....Crookston
Brown, P. W.....Rochester
Brown, S. E.....St. Paul
Bruner, Julian M.....Rochester
Brunsting, Louis A.....Rochester
Buck, Fred H.....Shakopee
Buie, L. A.....Rochester
Bulkley, Kenneth.....Minneapolis
Bullen, F. W.....Hibbing
Bumpus, H. C.....Rochester
Bumpus, Laurin Dudley.....Rochester
Burch, F. E.....St. Paul
Burfiend, G. H.....St. Paul
Burke, Charles F.....Rochester
Burnap, W. L.....Fergus Falls
Burns, F. W.....St. Paul
Burns, H. D.....Albert Lea
Burns, Herbert A.....Ah-gwah-ching
Burns, M. A.....Milan
Burns, R. L.....Two Harbors
Burns, R. M.....St. Paul
Burton, Carl G.....St. Paul
Buscher, Julius.....St. Cloud
Busher, H.....St. Paul
Butler, John.....Minneapolis
Button, A. J.....Greenbush
Butturff, C. R.....Freeborn
Butz, J. A.....Monterey
Butzer, John A.....Mankato
Buzzelle, L. K.....Minneapolis

Cable, Morris L.....Minneapolis
Cabot, George S.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Caine, C. E.....Morris
Caldwell, Jas. P.....St. Paul
Caldwell, Kenneth S.....St. Paul
Calhoun, F. W.....Albert Lea
Callahan, F. F.....Pokegama
Callerstrom, G. W.....Minneapolis
Cameron, Isabell.....Minneapolis
Cameron, J. A.....St. Paul
Cameron, Markley C., Jr.....Rochester

Camp, John D. Rochester
Camp, W. E. Minneapolis
Campbell, J. E. South St. Paul
Campbell, L. M. Minneapolis
Campbell, Orwood J. Minneapolis
Campbell, Robert Minneapolis
Canfield, Wayne W. Houston
Cannon, Harry St. Paul
Cantwell, W. F. International Falls
Cardle, Archibald E. Minneapolis
Carey, Jas. B. Minneapolis
Carlaw, C. M. Minneapolis
Carmen, J. E. Detroit Lakes
Carmichael, Hugh T. Rochester
Caron, Robert P. Minneapolis
Carroll, Wm. C. St. Paul
Carstens, C. F. Hibbing
Carter, Fred G. St. Paul
Cathcart, E. P. Rochester
Catlin, John J. Buffalo
Cavanor, F. T. Minneapolis
Cervenka, Charles F. New Prague
Chadbourn, A. G. Heron Lake
Chamberlain, H. E. Minneapolis
Chambers, W. C. Blue Earth
Chapman, C. B. Rochester
Chapman, T. L. Duluth
Chatterton, C. C. St. Paul
Cheleen, S. J. Minneapolis
Cheney, E. L. Duluth
Cherry, Chas. H. Minneapolis
Chesley, A. J. Minneapolis
Childrey, J. H. Rochester
Christensen, E. P. Two Harbors
Christensen, Eli E. Rochester
Christenson, C. R. Starbuck
Christiansen, A. St. Paul
Christianson, H. W. Rochester
Christie, G. R. Long Prairie
Christie, R. L. Long Prairie
Christison, J. T. St. Paul
Chumley, Charles L. Rochester
Chunn, Stanley S. Lake Wilson
Clark, F. F. Duluth
Clark, H. B. St. Cloud
Clark, H. S. Minneapolis
Clark, T. C. Minneapolis
Clay, F. H. St. Charles
Claydon, Donald R. Red Wing
Claydon, L. E. Red Wing
Clement, J. B. Lester Prairie
Clement, T. G. Duluth
Coakley, Leo P. Rochester
Cobb, S. G. St. Paul
Cobb, Willis F. Lyle
Cochrane, W. J. Lake City
Cohen, Sumner S. Oak Terrace
Colby, Woodard St. Paul
Cole, H. B. Redwood Falls
Cole, Wallace H. St. Paul
Coleman, F. B. Austin
Coleman, Julian Harwood Rochester
Collins, A. N. Duluth
Collins, Donald C. Rochester
Collins, H. C. Duluth
Collins, J. S. Wabasha
Colvin, A. R. St. Paul
Combacker, L. C. Fergus Falls
Comfort, Mandred W. Rochester
Comstock, A. E. St. Paul
Condit, W. H. Minneapolis
Conley, Alva A.* Cannon Falls
Conner, H. M. Rochester
Conner, Wm. H. Minneapolis
Connor, C. E. St. Paul
Cook, Henry W. Minneapolis
Cook, Paul B.* St. Paul
Cooke, Harry Hamilton Rochester
Cooney, H. C. Princeton
Cooper, F. G. Rochester
Cooper, M. D. Winnebago
Cooperman, H. O. Minneapolis
Copeland, M. M. Rochester
Corbett, J. Frank Minneapolis
Corniea, A. D. Minneapolis
Corr, W. P. Rochester
Corrigan, J. E. Spooner
Cosgriff, J. A. Olivia
Cosgrove, J. H. Duluth
Cosman, E. O. Minneapolis
Counseller, Virgil S. Rochester
Countryman, Roger S. St. Paul
Covell, W. W. St. Peter
Coventry, W. A. Duluth
Cowern, E. W. North St. Paul
Crafts, Leo M. Minneapolis
Craig, C. C. International Falls
Craig, Winchell McK. Rochester
Cranmer, Richard R. Minneapolis
Creighton, Ralph H. Minneapolis
Cremer, M. H. Red Wing

Crenshaw, J. L. Rochester
Cress, E. E. Boyd
Cress, P. J. Ellsworth
Crewe, J. E. Rochester
Critchfield, L. R. St. Paul
Crume, Geo. P. Minneapolis
Crump, J. W. St. Paul
Culligan, J. M. St. Paul
Culligan, Leo. C. St. Paul
Cumming, J. F. Morris
Curtin, John F. Minneapolis
Cutts, George Minneapolis

D'Arms, Harry Lee Hector
Dack, Lloyd G. St. Paul
Dady, Elmer E. Minneapolis
Dahl, Elmer O. Minneapolis
Dahl, G. A. Mankato
Dahl, John A. Minneapolis
Daignault, Oscar Benson
Daniel, Donald H. Minneapolis
Daniel, Lewis M. Minneapolis
Daniels, Harry A. Rochester
Daniels, J. W. St. Peter
Daniels, L. E. Rochester
Danielson, K. A. Litchfield
Darling, J. B. St. Paul
Dart, Leslie O. Minneapolis
Daugherty, E. B. St. Paul
Daugherty, L. E. St. Paul
Davis, Austin C. Rochester
Davis, B. F. Duluth
Davis, F. U. Faribault
Davis, I. Grant Peterson
Davis, Herbert St. Paul
Davis, L. Thomas Wadena
Davis, Thayer Clinton Wadena
Davis, William St. Paul
Davison, H. L. Rochester
Dawley, Walter Averill Rochester
Dean, Benjamin F. Rochester
De Boer, Hermanus Edgerton
De Carle, Donald W. Rochester
Decker, Walter J. Rochester
Dedolph, Karl St. Paul
Delmore, J. L. Roseau
Delougherty, J. St. Paul
Dempsey, D. P. Kellogg
Denman, A. V. Mankato
Derauf, B. I. St. Paul
Desjardins, Arthur U. Rochester
Devereaux, T. J. Wayzata
Dewar, J. E. Minneapolis
Dezell, Earl R. Minneapolis
Deziel, G. Minneapolis
Dickson, Thos. H., Jr. St. Paul
Diehl, Harold S. Minneapolis
Diessner, H. D. Minneapolis
Disen, C. F. Minneapolis
Ditmeier, L. M. G. Jasper
Ditmore, David C. Rochester
Dittman, Geo. C. St. Paul
Dixon, Claude F. Rochester
Dixon, Robert K. Rochester
Dodge, F. A. Le Sueur
Dohm, A. J. St. Paul
Dolan, C. P. Worthington
Dolder, F. C. Eyota
Doleman, Nathan F. Tintah
Doms, H. C. Slayton
Donald, Joseph M. Rochester
Donaldson, C. A. Mesa, Arizona
Donohue, Philip F. St. Paul
Doolittle, L. E. Duluth
Dordal, J. Sacred Heart
Dorge, Richard I. Minneapolis
Dornblaser, H. Bright Minneapolis
Down, Howard I. Rochester
Dowswell, W. J. Kerkhoven
Doxey, G. L. Minneapolis
Doyle, J. B. Rochester
Doyle, L. O. Minneapolis
Drake, C. R. Minneapolis
Drake, Carl B. St. Paul
Drake, F. A. Lanesboro
Dredge, H. P. Sandstone
Dreisbach, N. Minneapolis
Drenning, F. C. Duluth
Drips, D. G. Rochester
Droegemueller, E. H. Rochester
Drought, W. W. Fergus Falls
Dubbe, F. H. New Ulm
DuBois, J. A. Sauk Center
DuBois, J. F. Sauk Center
Dudley, J. H. Windom
Duff, Edwin R. Minneapolis
Dulude, S. Dassel
Dumas, Alexander G. Minneapolis
Duncan, Henry Marietta
Dungay, Neil S. Northfield
Dunlap, E. H. Minneapolis
Dunlap, H. F. Rochester
Dunlop, Alex. Crookston

Dunn, Geo. R. Minneapolis
Dunn, J. N. St. Paul
Dunne, Gerald P. St. Paul
Dunsmoor, F. A. Minneapolis
Durgin, F. L. Winnebago
Dutton, C. E. Minneapolis
Dworsky, Samuel D. Minneapolis

Earl, George A. St. Paul
Earl, Robert O. St. Paul
Eberlin, E. A. Glenwood
Eby, C. B. Spring Valley
Eckman, P. F. Duluth
Eckstein, A. W. Mankato
Edlund, G. St. Paul
Edstrom, Henry Crookston
Edward, George Canton
Edwards, Ralph T. Elysian
Egilsrud, Kristian Minneapolis
Ehrenberg, C. J. Minneapolis
Ehrlich, S. Paul Minneapolis
Eitel, Geo. D. Minneapolis
Ekblad, J. W. Duluth
Eklund, E. J. Norwood
Eklund, Wm. J. Duluth
Elias, F. J. Duluth
Ellingson, A. R. Detroit Lakes
Ellison, David E. Minneapolis
Ellison, Frank E. Monticello
Elsey, J. R. Glenwood
Ely, O. S. South St. Paul
Emerson, E. C. St. Paul
Emmerson, W. S. Mayer
Emmons, W. F. Rochester
Endress, E. K. St. Paul
Engberg, E. J. St. Paul
Engelhart, P. C. Minneapolis
Engstrand, Oscar J. Warren
Engstrom, Geo. F. Belgrade
Eppard, R. M. Cloquet
Erb, F. A. Minneapolis
Erdmann, C. A. Minneapolis
Ericksen, L. G. Wood Lake
Erickson, J. L. Hendricks
Ericson, J. G. Minneapolis
Ericson, Swan Le Sueur
Ernest, G. C. St. Paul
Ertel, E. Q. Ellendale
Eshelby, E. C. St. Paul
Esser, John Perham
Estrem, C. O. Fergus Falls
Estrem, T. A. Hibbing
Eusterman, G. B. Rochester
Evans, Edward T. Minneapolis
Evarts, Arrah B. Rochester
Ewing, C. F. Wheaton
Exley, E. W. F. Minneapolis

Fahey, E. W. St. Paul
Fansler, W. A. Minneapolis
Farabaugh, Charles L. Minneapolis
Farr, R. E. Minneapolis
Farrell, H. J. Rochester
Farrish, R. C. Sherburn
Faust, Louis S. Rochester
Fauster, John U., Jr. Rochester
Fauth, Karl J. Gaylord
Fawcett, A. Maxwell Renville
Fawcett, C. E. Stewartville
Fawcett, Keith R. Duluth
Feeney, John M. Minneapolis
Fehland, Harold R. Rochester
Fenger, E. Oak Terrace
Ferguson, J. C. St. Paul
Ferreira, Gideon J. Duluth
Fetter, Mary Winona
Figi, F. A. Rochester
Fink, Leo W. Minneapolis
Fink, Walter H. Minneapolis
Finney, W. P., Jr. Rochester
Fischer, H. P. Shakopee
Fischer, Mario McC. Duluth
Fischer, P. M. Shakopee
Fitzgerald, E. T. Morris
Fitzgibbon, T. G. Rochester
Fjelstad, C. Alford Minneapolis
Flagstad, A. E. St. Paul
Fleischhauer, D. S. Wabasha
Flemming, A. S. Minneapolis
Fleming, James Cloquet
Fleming, T. N. St. Cloud
Flinn, B. P. Redwood Falls
Flinn, T. E. Redwood Falls
Flom, A. O. Chisago City
Flores, O. T. Dodge Center
Flower, W. Z. Minneapolis
Fogarty, Chas. W. St. Paul
Foley, F. E. B. St. Paul
Folken, F. G. Albert Lea
Forbes, R. S. Duluth
Ford, Burton C. Marshall
Ford, Frances A. Rochester
Forrest, C. G. Clearbrook

*Deceased

Fortin, Harry J.....Rochester
Fortney, A. C.....St. Paul
Foshager, Henry T.....Clara City
Foster, W. K.....Minneapolis
Foster, Wilmot C.....Rochester
Fowler, L. H.....Minneapolis
Fox, Ben.....Rochester
Fox, John M.....Minneapolis
Franchere, F. W.....Lake Crystal
Francis, David W.....Morristown
Fredericks, George M.....Minneapolis
Fredrickson, Alice C.....Lake Lillian
Fredrickson, Guy U. Y.....Lake Lillian
Freeborn, J. A.....Fergus Falls
Freed, O. J. R.....Cokato
Freeman, C. D.....St. Paul
Freeman, Geo. H.....St. Peter
Freeman, J. P.....Albert Lea
Freeman, W. L.....St. Cloud
Freligh, W. P.....Albert Lea
French, H. S.....Duluth
Freymiller, E. F.....Markville
Fricke, Robert E.....Rochester
Friedell, A.....Minneapolis
Friesleben, Wm.....Sauk Rapids
Frisch, F. P.....Willmar
Fritsche, Albert.....New Ulm
Fritsche, L. A.....New Ulm
Froehlich, H. W.....Thief River Falls
Frost, Harry T.....Wadena
Frost, Russell H.....Wabasha
Fugina, George R.....Mankato
Fulcher, Oscar Hugh.....Rochester
Fulton, J. F.....St. Paul
Funk, Victor K.....Oak Terrace

Gaalaas, A. F.....Wadena
Gaarde, F. W.....Rochester
Gager, E. C.....St. Paul
Gaines, E. C.....Buffalo Lake
Gallagher, B. J.....Waseca
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gamble, R. M.....Albert Lea
Gammell, J. H.....Minneapolis
Garand, J. H.....Dayton
Garbrecht, Arthur.....St. Paul
Gardiner, D. G.....St. Paul
Gardner, Edwin L.....Minneapolis
Gardner, V. H.....Fairmont
Gardner, Walter P.....St. Paul
Garlock, A. V.....Bemidji
Garlock, Dewitt H.....Bemidji
Gault, C. C.....Owatonna
Geer, Everett K.....St. Paul
Gehlen, J. N.....St. Paul
Geist, Emil S.....Minneapolis
Geist, George A.....St. Paul
Gelz, J. J.....St. Cloud
Gemo, Chas.....Balaton
Ghent, Harry C.....St. Paul
Ghent, M. M.....St. Paul
Ghormley, Ralph K.....Rochester
Ghostley, Mary C.....Puposky
Ghrist, D. G.....Rochester
Gibbon, L. L.....Lowry
Gibbons, Francis C.....Comfrey
Giere, E. O.....Minneapolis
Giere, J. C.....Minneapolis
Giere, Richard W.....Minneapolis
Giere, S. W.....Benson
Giesen, A. F.....Starbuck
Giessler, Paul W.....Minneapolis
Giffin, H. Z.....Rochester
Gilfillan, J. S.....St. Paul
Gilles, F. L.....Minneapolis
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Gingold, Benjamin A.....Minneapolis
Ginsberg, Harry.....Minneapolis
Ginsberg, Wm.....St. Paul
Giroux, A. A.....Duluth
Girvin, R. B.....Minneapolis
Goblirsch, A. P.....Sleepy Eye
Goeckerman, W. H.....Rochester
Goehrs, H. W.....St. Cloud
Goforth, Clifford.....St. Peter
Goldberg, Isadore M.....Minneapolis
Golden, C. M.....Tyler
Goltz, E. V.....St. Paul
Good, Louis P.....Rochester
Gorder, Arne Christian.....Rochester
Gosin, D. F.....Minneapoils
Gosslee, G. L.....Moorhead
Gowan, L. R.....Duluth
Graham, A. Stephens.....Rochester
Graham, David.....Duluth
Graham, R. D.....Duluth
Graham, Robert.....Duluth
Grant, H. W.....St. Paul
Gratzek, Frank R.....Minneapolis
Gratzek, Thos.....St. Paul
Grave, Floyd.....Minneapolis
Graves, W. N.....Duluth
Grawn, F. A.....Duluth
Gray, F. D.....Marshall
Gray, Howard Kramer.....Rochester
Greeley, Horace, Jr.....Rochester
Green, E. K.....Minneapolis
Greene, Carl H.....Rochester
Greene, W. P.....Minneapolis
Greisheimer, Esther M.....Minneapolis
Griffin, P. J.....Fertile
Grimes, H. B.....Madelia
Grinnell, W. B.....Preston
Grise, W. B.....Austin
Grogan, J. S.....Wadena
Groschupf, Theo. Paul.....Bemidji
Grose, Fredk. N.....Clarissa
Gruenhagen, Arnold P.....St. Paul
Gullixson, A.....Albert Lea
Gunderson, Nels A.....Minneapolis
Gustafson, H. T.....Minneapolis

Habein, Harold C.....Rochester
Haberman, E.....Osakis
Hacking, Frank H.....Minneapoils
Haddow, N. W.....Minneapolis
Haessley, S. B.....Faribault
Hagaman, Geo. K.....St. Paul
Hagen, G. L.....Minneapolis
Hagen, H. O.....New Richland
Hagen, O. E.....Butterfield
Hagen, Olaf J.....Moorhead
Haggard, G. D.....Minneapolis
Haines, J. H.....Stillwater
Haines, S. F.....Rochester
Halenbeck, Philip Luther.....St. Cloud
Halgren, Harry A.....Watertown
Hall, A. R.....St. Paul
Hall, Andrea E.....Virginia
Hall, Henry H.....St. Paul
Hall, J. M.....Minneapolis
Hall, S. S.....Minneapolis
Hallberg, C. A.....Minneapolis
Hallenbeck, D. F.....Rochester
Halloran, Walter.....Jackson
Halper, Philip.....St. Paul
Hamel, Arnold L.....Minneapolis
Hamilton, A. S.....Minneapolis
Hamlin, George B.....Minneapolis
Hammermeister, Theodore F.....New Ulm
Hammes, E. M.....St. Paul
Hammond, A. J.....Minneapolis
Hammond, J. F.....St. Paul
Hand, John R.....Rochester
Hand, W. R.....Elbow Lake
Hane, Richard L.....Rochester
Haney, C. L.....Duluth
Hanlon, Frank R.....Rochester
Hannah, Hewitt B.....Minneapolis
Hansen, Arild E.....Minneapolis
Hansen, Erling.....Minneapolis
Hansen, M.....Ada
Hansen, Olga S.....Minneapolis
Hansen, Rorbye.....Buhl
Hanson, A. M.....Faribault
Hanson, H. J.....Minneapolis
Hanson, H. V.....Minneapolis
Hardeman, Daniel R., Jr.....Rochester
Harmon, G .E.....St. Paul
Hare, E. R.....Minneapolis
Harriman, L.....Howard Lake
Harrington, C. D.....Minneapolis
Harrington, F. E.....Minneapolis
Harrington, S. W.....Rochester
Harris, C. N.....Chisholm
Hart, Alfred B., Jr.....Owatonna
Hartfiel, Wm. F.....St. Paul
Hartley, E. C., Jr.....St. Paul
Hartman, Howard R.....Rochester
Hartwell, Shattuck W. .....Muskegon, Michigan
Hartzell, John B.....Rochester
Hartzell, Thos. B.....Minneapolis
Haskell, A. D.....Alexandria
Hassett, Roger G.....Mankato
Hastings, D. R.....Minneapolis
Hatch, W. E.....Duluth
Hathaway, J. C.....Minneapolis
Hathaway, S. J.....Proctor
Hauge, M. M.....Clarkfield
Hauser, V. P.....St. Paul
Havens, Fred Z.....Rochester
Havens, John G. W.....Austin
Haverfield, Addie R.....Minneapolis
Hawkins, V. J.....St. Paul
Hawkinson, John P.....Crosby
Hawkinson, L. F.....Brainerd
Hawkinson, R. P.....Minneapolis
Hayes, J. M.....Minneapolis
Hayes, M. F.....Nashwauk
Haynes, A. L.....Faribault
Haynes, B. H.....Butterfield
Hazeltine, M. E.....Rochester
Haynes, M. H.....Duluth
Head, Douglas P.....Minneapolis
Head, G. D.....Minneapolis
Healy, R. T.....Pierz
Hearn, Wm. O.....Minneapolis
Heath, A. C.....St. Paul
Hebeisen, M. B.....Carver
Heck, Frank Joseph.....Rochester
Heck, Wm. W.....St. Paul
Hedback, A. E.....Minneapolis
Hedding, J. A.....Minneapolis
Hedenstrom, F. G.....St. Paul
Hedenstrom, L. H.....Cambridge
Hefke, Hans W.....Rochester
Hegge, O. H.....Austin
Hegge, R. S.....Austin
Heiberg, E. A.....Fergus Falls
Heim, Russell R.....Minneapolis
Heimark, J. H.....Moorhead
Heimark, J. J.....Fairmont
Heimark, O. E.....Duluth
Heimdal, Clarence O.....Rochester
Heise, W. F. C.....Winona
Helk, H. H.....Minneapolis
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Helmholtz, H. F.....Rochester
Hempstead, B. E.....Rochester
Hemstead, Werner.....St. Cloud
Hench, Philip S.....Rochester
Henderson, A. J.....Kiester
Henderson, M. S.....Rochester
Hengstler, W. H.....St. Paul
Henney, Wm. H.....McIntosh
Hendrickson, J. F.....Minneapolis
Henriksen, H. G.....Elko
Henry, C. E.....Minneapolis
Henry, Myron O.....Minneapolis
Hensel, C. N.....St. Paul
Henslin, A. E.....Le Roy
Herbolsheimer, A. J.....Minneapolis
Herbst, Wm. P.....Minneapolis
Herman, Arthur L.....Minneapolis
Hermanson, Peter E.....Hendricks
Herrmann, Edgar T.....St. Paul
Hertel, G. E.....Austin
Hesselgrave, S. S.....St. Paul
Hewson, Wilfred J.....Stillwater
Heyerdale, O. C.....Rochester
Hiebert, J. P.....Minneapolis
Hielscher, Helen H.....Mankato
Hielscher, Julian A.....Mankato
Higbee, Paul A.....Minneapolis
Higgins, J. H.....Minneapolis
Hilbert, Eunice.....Minneapolis
Hilding, Anderson C.....Duluth
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, J. M.....Iona
Hilger, L. A.....St. Paul
Hill, Eleanor J.....Minneapolis
Hill, Frederick C.....Rochester
Hill, Frederick E.....Duluth
Hillyard, Lorin Victor.....Rochester
Hiniker, Peter J.....Le Sueur
Hirschboeck, F. J.....Duluth
Hirschfelder, A. D.....Minneapolis
Hirschfield, Adolph.....Minneapolis
Hirschfield, M. S.....Duluth
Hirshfield, F. R.....Minneapolis
Hitchings, W. S.....Lakefield
Hoaglund, A. W.....Minneapolis
Hobbs, C. A. .....Minneapolis
Hochfilzer, J. J.....St. Paul
Hodapp, R. J.....Willmar
Hodge, S. V.....Minneapolis
Hodgson, H. H.....Crookston
Hoff, Alfred.....St. Paul
Hoffman, Max H.....St. Paul
Hoidale, A. D.....Tracy
Hoiland, A. S.....Minneapolis
Holbrook, J. S.....Mankato
Holcomb, J. T.....St. Paul
Holcomb, O. W.....St. Paul
Holderman, J. W.....Duluth
Holdridge, Geo.....Foley
Holen, T.....Minneapolis
Holl, P. M.....Minneapolis
Holland, Wilbur W.....Rochester
Hollands, W. H.....Fisher
Holm, C. E.....Isle
Holm, Geo. A.....Minneapolis
Holm, H. H.....Glencoe
Holmberg, L. J.....Canby
Holmes, A. E.....Rush City
Holmes, W. B.....Ada
Holst, C. F.....Little Falls
Holst, J. B.....Little Falls
Holt, John E.....St. Paul
Holt, Wm. B.....Minneapolis
Holtan, Theodore.....Waterville
Holte, H.....Crookston

Hookey, J. A.....Rochester
Horton, Bayard T.....Rochester
Houkom, Bjarne.....Fergus Falls
House, Z. E.....Cass Lake
Houston, C. A.....Park Rapids
Hovde, Rolf.....Winthrop
Howard, M. I.....Mankato
Howard, William H.....Minneapolis
Howard, W. S.....St. Paul
Huenekens, E. J.....Minneapolis
Huffington, H. L.....Mankato
Hughes, Louis D.....Minneapolis
Hullsiek, H. E.....St. Paul
Hullsiek, Richard B.....St. Paul
Hultkrans, Joel C.....St. Paul
Hultkrans, R. E.....Rush City
Humphrey, E. W.....Moorhead
Humphrey, W. R.....Stillwater
Hunt, F. N.....Fairmont
Hunt, H. E.....St. Paul
Hunt, R. C.....Fairmont
Hunt, V. C.....Rochester
Hunte, A. F.....Truman
Hurd, Annah.....Minneapolis
Hurt, Algernon S., Jr.....Rochester
Hutchinson, Charles J.....Minneapolis
Hutchinson, Henry.....New London
Hutterer, Edw. G.....Winsted
Huxley, Frederick R.....Faribault
Hyde, Theodore L.....Rochester
Hymes, Charles.....Minneapolis
Hynes, James.....Minneapolis
Hynes, John E.....Minneapolis

Ide, A. W.....St. Paul
Ikeda, Kano.....St. Paul
Irvine, H. G.....Minneapolis
Irwin, Alex F.....Minneapolis

Jackson, C. M.....Minneapolis
Jacobs, A. C.....Elmore
Jacobs, Jno. C.....Willmar
Jacobson, Clarence.....Chisholm
Jacobson, David J.....Blackduck
Jacquot, G. L.....Marshall
Jamieson, Earl.....Walnut Grove
Jennings, Frank L.....Oak Terrace
Jennings, Mary H.....Minneapolis
Jensen, A. H.....Hutchinson
Jensen, Herman H.....Atwater
Jensen, M. J.....Minneapolis
Jensen, T. J.....Duluth
Johnson, A. E.....Minneapolis
Johnson, A. E.....Red Wing
Johnson, A. Elof.....Minneapolis
Johnson, Asa M.....St. Paul
Johnson, C. M.....Dawson
Johnson, E. W.....Bemidji
Johnson, Ellsworth.....Rochester
Johnson, H. M.....Dawson
Johnson, H. P.....Fairmont
Johnson, H. W.....Rochester
Johnson, Hans.....Kerkhoven
Johnson, Hartland C.....St. Paul
Johnson, James A.....Minneapolis
Johnson, Julius.....Minneapolis
Johnson, Nimrod A.....Minneapolis
Johnson, Norman.....Minneapolis
Johnson, O. H.....Echo
Johnson, O. V.....Fergus Falls
Johnson, Odin J.....Minneapolis
Johnson, R. A.....Minneapolis
Johnson, Ray G.....St. Paul
Johnson, Selmer M.....Minneapolis
Johnson, T. H.....St. Paul
Johnson, Verner P.....Delano
Johnson, Walfred.....Sauk Center
Johnson, Walter R.....Rochester
Jones, A. W.....Red Wing
Jones, D. C.....St. Paul
Jones, E. M.....St. Paul
Jones, G. M.....Minneapolis
Jones, H. W.....Minneapolis
Jones, Richard N.....St. Cloud
Jones, W. A.....Minneapolis
Jones, William R.....Minneapolis
Jordan, Ferdinand M.....Rochester
Josewich, Alexander.....Minneapolis
Josewski, R. J.....Stillwater
Joyce, George Leo.....Stewartville
Joyce, G. T.....Rochester
Judd, E. S.....Rochester
Judge, Walter T.....Graceville
Juergens, H. M.....Belle Plaine
Juliar, R. O.....St. Clair
Just, Herman J.....Lafayette
Kaasa, L. J.....Albert Lea

*Deceased

Kadesky, David.....St. Paul
Kahala, Arthur.....Crookston
Kalinoff, D.....Stillwater
Kamman, Gordon R.....St. Paul
Kamp, B. A.....Albert Lea
Kannary, E. L.....St. Paul
Kanne, C. W.....Faribault
Karn, B. R.....Ortonville
Kaufman, Wm. C.....Appleton
Kaufman, A. J.*.....Franklin
Keith, H. M.....Rochester
Keith, N. M.....Rochester
Kelby, G. M.....Minneapolis
Kelling, Louis F.....Lakefield
Kelly, B. W.....Aitkin
Kelly, John V.....St. Paul
Kelly, Paul H.....St. Paul
Kelsey, C. G.....Hinckley
Kemp, A. F.....Mankato
Kemp, M. W.....Fergus Falls
Kendahl, A. M.....Jasper
Kennedy, C. C.....Minneapolis
Kennedy, Jane F.....Minneapolis
Kennedy, R. Roy.....Minneapolis
Kennedy, Roger L. J.....Rochester
Kennedy, W. A.....St. Paul
Kenny, H. F.....St. Paul
Kenyon, Paul.....Wadena
Kepler, Edwin J.....Rochester
Kerlan, M.....Philadelphia, Pa.
Kern, M. J.....St. Cloud
Kernohan, James W.....Rochester
Kerschbaumer, Louisa.....St. Peter
Kesting, Herman.....St. Paul
Keyes, C. R.....Duluth
Keyes, E. D.....Winona
Keyes, J. D.....Winona
Kibbe, O. A.....Minneapolis
Kiefer, M. A.....Sleepy Eye
Kierland, P. E.....Alexandria
Kiesling, I. H.....Nashwauk
Kilbourne, A. F.....Rochester
Kilbride, E. A.....Worthington
Kilbride, J. S.....Canby
Kilgore, G. L.....Rochester
King, E. A.....Minneapolis
King, George L.....St. Paul
King, Harry T.....Minneapolis
King, W. R.....Minneapolis
King, Z. P.....St. Paul
Kingsbury, E. M.....Clearwater
Kinsella, Thomas J.....Oak Terrace
Kintner, Arthur R.....Rochester
Kirk, G. P.....East Grand Forks
Kirklin, B. R.....Rochester
Kistler, A. J.....Minneapolis
Kistler, A. S.....St. Paul
Kistler, C. M.....Minneapolis
Kittelson, T. N.....Fergus Falls
Klaveness, E.....St. Paul
Klein, H. N.....St. Paul
Klein, Harry.....Duluth
Kliman, F. E.....Duluth
Klima, W. W.....Stewart
Knapp, F. N.....Duluth
Knauff, M. K.....St. Paul
Knight, Ray R.....Minneapolis
Knight, Ralph T.....Minneapolis
Koch, John C.....Minneapolis
Koenigsberger, Charles.....Mankato
Kohlbry, C. O.....Duluth
Kohler, D. W.....St. Joseph
Kohler, G. A.....Minneapolis
Kolars, J. J.....LeSueur Center
Koller, Herman M.....Minneapolis
Koller, L. R.....Minneapolis
Kolset, Carl D.....Sanborn
Kooiker, Herman J.....Milaca
Koop, S. H.....Richmond
Kraft, Peter.....Duluth
Krantz, C. I.....Duluth
Kremer, Walter J.....Minneapolis
Kreuzer, Titus C.....Austin
Kriedt, Daniel.....Minneapolis
Kucera, Frank J.....Hopkins
Kucera, Wm. J.....Minneapolis
Kuhlman, August.....Melrose
Kumm, Frederick F.....Wadena
Kusske, A. L.....New Ulm
Kuth, J. R.....Duluth
Kvitrud, G.....St. Paul

Lacy, Nichols E.....Rochester
Laird, A. T.....Nopeming
Lajoie, John M.....Minneapoils
Lamont, John C.....Nopeming
Langenderfer, F. V.....St. Paul
Langhoff, A. H.....Glencoe
Lannin, J. C.....Mabel
Lapierre, A. P.....Minneapolis
Lapierre, C. A.....Minneapolis
Lapierre, J. T.....Minneapolis

Larsen, C. L.....St. Paul
Larsen, O. O.....Detroit Lakes
Larson, A. L.....Duluth
Larson, Clarence M.....Minneapolis
Larson, Lawrence M.....Rochester
Larson, Leonard M.....Oak Terrace
Laughlin, J. T.....Grey Eagle
La Vake, R. T.....Minneapolis
Law, A. A.....Minneapolis
Lawrent, A. A.....Minneapolis
Lax, Morris H.....St. Paul
Lazar, H. L.....Minneapolis
Leahy, Bartholomew.....St. Paul
Learmonth, James R.....Rochester
Leavenworth, Richard O.....St. Paul
Leavitt, H. H.....Minneapolis
Lebowski, Joseph A.....Minneapolis
Leck, Clifford C.....Austin
Leddy, Eugene T.....Rochester
Lee, H. M.....Minneapolis
Lee, J. L.....Watertown
Lee, W. A.....Fergus Falls
Lee, Walter N.....Madison
Leebens, J. H.....Lismore
Leibold, H. H.....Parkers Prairie
Leitch, Archibald.....St. Paul
Leitch, N. M.....Warroad
Leland, Harold R.....Minneapolis
Leland, John T.....Herman
Leland, M. N.....Minneapolis
Lemon, W. S.....Rochester
Lemstrom, Jarl.....Minneapolis
Lenander, Melvin E.....St. Peter
Lende, Norman.....Faribault
Lenont, C. B.....Virginia
Leonard, Gilbert J.....St. Paul
Leonard, L. J.....Minneapolis
Leopard, B. A.....New Richland
Lepak, F. J.....Duluth
Lepak, John A.....St. Paul
Lerche, William.....Cable, Wis.
Leuty, Amos.....Morris
Levin, Bert.....St. Paul
Levine, N. M.....Minneapolis
Levins, H. E.....Askov
Lewis, A. J.....Henning
Lewis, C. B.....St. Cloud
Lewis, Charles F.....Austin
Lewis, W. W.....St. Paul
Lexa, F. J.....Lonsdale
Libert, John N.....St. Cloud
Lichtenstein, H.....Winona
Lick, C. Louis.....St. Paul
Liedloff, A. G.....Mankato
Liffrig, W. W.....Goodhue
Lillehei, E. J.....Minneapolis
Lillie, H. I.....Rochester
Lillie, W. I.....Rochester
Lima, Ludvig.....Montevideo
Lind, C. J.....Minneapolis
Lindahl, Merlyn J.....Winthrop
Lindberg, A. L.....Wheaton
Linde, Herman.....Cyrus
Lindquist, R. H.....Minneapolis
Lindsay, W. V.....Winona
Lineberry, E. D.....Rochester
Linner, H. P.....Minneapolis
Linton, W. B.....Minneapolis
List, Walter E.....Minneapolis
Litchfield, John T.....Minneapolis
Litman, Samuel N.....Duluth
Little, W. J.....St. Paul
Litzenberg, J. C.....Minneapolis
Lloyd, H. J.....Mankato
Lochead, Daniel C.....Rochester
Locken, O. E.....Crookston
Logan, A. H.....Rochester
Logan, F. W.....Blue Earth
Logefeil, Rudolph C.....Minneapolis
Lommen, A. P.....Lanesboro
Lommen, P. A.....Austin
Loney, W. R. R.....Rochester
Long, Jesse.....Minneapolis
Loofbourrow, Elias H.....Keewatin
Loomis, E. A.....Minneapolis
Loughery, Harold B.....Rochester
Love, Fred A.....Carlos
Love, J. G.....Rochester
Lowe, Earl R.....South St. Paul
Lowe, Thos.....Pipestone
Lowe, Thomas A.....South St. Paul
Luedke, G. H.....Fairmont
Lum, C. E.....Duluth
Lundgren, A. C.....Minneapolis
Lundholm, A. M.....St. Paul
Lundquist, E. F.....Minneapolis
Lundy, John S.....Rochester
Lynch, M. J.....Minneapolis
Lynde, Orrin G.....Thief River Falls
Lyng, John A.....Minneapolis
Lyon, E. P.....Minneapolis
Lyon, J. D.....Minneapolis
Lysne, Henry.....Minneapolis

McBeath, Ewing C. New York City
McBride, William P. Rochester
McBroom, D. E. Cambridge
McCarthy, Donald Minneapolis
McCarthy, W. J. Madelia
McCarthy, W. R. St. Paul
McCartney, James S. Minneapolis
McCarty, Ray B. Rochester
McCarty, P. D. Ely
McCaughan, John M. Rochester
McClanahan, J. H. White Bear
McClanahan, T. S. White Bear
McCloud, C. N. St. Paul
McComb, C. F. Duluth
McCoy, Mary Duluth
McCrea, James Fulda
McCuskey, Charles F. Rochester
McDaniel, Orianna Minneapolis
McDaniel, S. P. Mountain Iron
McDonald, A. L. Duluth
McDonell, C. H. Winona
McDowell, J. P. St. Cloud
McEachran, A. Minneapolis
McFarland, A. H. Minneapolis
McGandy, R. F. Minneapolis
McGeary, Geo. E. Minneapolis
McGiffert, E. N. Duluth
McGroarity, J. J. Easton
McGuigan, H. T. Red Wing
McHaffie, O. L. Duluth
McHugh, Roderica F. Aitkin
McIntire, H. M. Waseca
McIntyre, Geo. Minneapolis
McIntyre, John A. Owatonna
McIver, R. A. Lowry
McKaig, Carle B. Pine Island
McKechnie, Wilfred St. Peter
McKenna, J. K. Austin
McKeown, E. G. Pipestone
McKeon, J. O. Montgomery
McKeon, James St. Paul
McKibben, H. E. St. Cloud
McKinlay, C. A. Minneapolis
McKinley, J. C. Minneapolis
McKinney, F. S. Minneapolis
McLaren, Jennette M. St. Paul
McLaughlin, E. M. Winona
McNevin, C. F. St. Paul
McNutt, John R. Minneapolis
McPheeters, H. O. Minneapolis
Macbeth, J. L. St. Clair
MacDonald, A. E. Minneapolis
MacDonald, D. A. Minneapolis
MacDonald, Irving C. Minneapolis
MacFarlane, P. H. Chisholm
Mach, Frank B. Minneapolis
Macnie, John P. Minneapolis
Macnie, J. S. Minneapolis
MacRae, Gordon C. Duluth
Maertz, W. F. New Prague
Magath, T. B. Rochester
Magee, Henry R. Rochester
Magie, W. H. Duluth
Magney, F. H. Duluth
Mahorner, Howard R. Rochester
Mahowald, A. Albany
Maitland, D. P. Jackson
Major, S. G. Rochester
Maland, C. O. Minneapolis
Malmgren, George E. Rochester
Manley, J. R. Duluth
Mann, A. T. Minneapolis
Manson, F. M. Worthington
Marcley, W. J. Minneapolis
Marcum, E. H. Bemidji
Margolis, Harry M. Rochester
Mariette, Ernest Oak Terrace
Mark, D. B. Minneapolis
Marken, M. H. Fairmont
Marshall, James M. Rochester
Martin, Edw. T. Duluth
Martin, W. C. Duluth
Martineau, J. L. St. Paul
Martinson, C. J. Wayzata
Mason, J. B. Rochester
Masson, D. M. Rochester
Masson, J. C. Rochester
Matchan, Glen R. Minneapolis
Matthews, Justus Minneapolis
Mattill, P. M. Oak Terrace
Mattison, P. A. Winona
Mattson, Hamline Rochester
Maxeiner, S. R. Minneapolis
May, W. H. Minneapolis
Mayland, M. L. Faribault
Mayne, Roy M. Duluth
Mayo, C. H. Rochester
Mayo, Charles W. Rochester
Mayo, Joseph G. Rochester
Mayo, W. J. Rochester
Maytum, Charles K. Rochester
Meckstroth, C. W. Brandon
Meierding, Wm. A. New Ulm
Meinert, A. E. Winona
Melby, Benedik Blooming Prairie
Mellby, O. F. Thief River Falls
Melzer, G. R. Lyle
Mercil, William F. Crookston
Merkert, Charles E. Minneapolis
Merkert, G. L. Minneapolis
Merriman, L. L. Duluth
Mesker, G. H. Olivia
Metheny, David Rochester
Meyer, A. A. Melrose
Meyer, E. L. Minneapolis
Meyer, P. F. Faribault
Meyerding, E. A. St. Paul
Meyerding, H. W. Rochester
Michael, J. C. Minneapolis
Michelson, H. E. Minneapolis
Miller, H. A. Fairmont
Miller, V. I. Mankato
Miller, W. A. New York Mills
Mills, J. L. Winnebago
Mills, Ralph G. Rochester
Mitchell, A. B. Hector
Mitchell, R. S. Grand Meadow
Moe, Russel J. Duluth
Moe, Thomas Moose Lake
Moen, J. K. Jr. Minneapolis
Moench, Mary Rochester
Moersch, F. P. Rochester
Moersch, H. J. Rochester
Moga, John A. St. Paul
Mogilner, S. N. St. Paul
Mohardt, John H. Rochester
Moir, Wm. W. Minneapolis
Molander, H. A. St. Paul
Monahan, R. H. Minneapolis
Monroe, P. B. Soudan
Montgomery, Hamilton Rochester
Mooney, Leo P. Marble
Moore, A. B. Rochester
Moorhead, M. B. Minneapolis
Moquin, Marie A. St. Paul
More, C. W. Eveleth
Morehead, D. E. Rochester
Moren, Edwin Minneapolis
Morgan, Sherburn F. Rochester
Moriarty, Cecile R. Minneapolis
Mork, B. O. Worthington
Morley, G. A. Crookston
Morrison, A. W. Minneapolis
Morrissey, F. B. St. Paul
Morrow, James J. Austin
Morsman, L. W. Hibbing
Morse, M. P. Le Roy
Morss, C. R. Zumbrota
Mortenson, N. G. St. Paul
Morton, H. McI. Minneapolis
Morton, Herschel B. Rochester
Moses, Joseph Jr. Northfield
Moyer, Ralph E. Bemidji
Moynihan, A. F. Sauk Center
Moynihan, T. J. St. Paul
Mroz, Rudolph J. Rochester
Mueller, S. C. Rochester
Mulholland, Stanford W. Rochester
Muller, R. Theo. St. Paul
Murdoch, J. M. Faribault
Murphy, George T. Rochester
Murphy, Ignatius J. Minneapolis
Murray, D. D. Duluth
Mussey, R. D. Rochester
Myers, J. A. Minneapolis
Myers, Thos. St. Paul
Myre, C. R. Paynesville

Nabers, L. W. Rochester
Naegeli, A. E. St. Paul
Naegeli, Frank Fergus Falls
Nagel, H. D. Waconia
Nass, H. A. Mabel
Nathanson, M. H. Minneapolis
Nauth, W. W. Winona
Neher, F. H. St. Paul
Nelson, C. P. Minneapolis
Nelson, E. H. Chisholm
Nelson, Ernest J. Owatonna
Nelson, H. E. Crookston
Nelson, H. S. Minneapolis
Nelson, L. A. St. Paul
Nelson, M. S. Granite Falls
Nelson, Nesmith Brainerd
Nelson, O. E. Minneapolis
Nelson, O. N. Battle Lake
Nelson, R. L. Duluth
Nelson, Wallace I. Underwood
Nelson, Wallace L. Rochester
Nesbit, Mark Edwin Rochester
Neseth, O. S. Kenyon
Nethercott, E. G. Pine City
Neumann, C. A. Lewiston
New, G. B. Rochester
Newhart, Horace Minneapolis
Nicholson, M. A. Duluth
Nickel, Allen A. C. Rochester
Nickerson, W. S. Faribault
Nippert, H. T. St. Paul
Nordin, C. G. St. Paul
Nordin, G. T. Minneapolis
Nordland, Martin Minneapolis
Norman, J. F. Crookston
Norment, William B. Rochester
Norris, Edgar H. St. Paul
Norris, G. H. Annandale
Norton, Manville W. Rochester
Noth, H. W. Minneapolis
Novak, E. E. New Prague
Nunn, Leslie L. Rochester
Nusbaum, D. H. Jackson
Nutting, Roland E. Rochester
Nye, Katherine A. St. Paul
Nye, Lillian L. St. Paul

O'Brien, H. J. St. Paul
O'Brien, Wm. A. Minneapolis
O'Connor, D. C. Eden Valley
O'Connor, J. P. St. Paul
O'Connor, L. J. St. Paul
O'Donnell, D. M. Ortonville
O'Donnell, J. E. Minneapolis
O'Hara, J. J. Janesville
O'Leary, P. A. Rochester
Oberg, C. M. Minneapolis
Ochsner, Harold C. Rochester
Oerting, Harry St. Paul
Offutt, Susan R. Rochester
Ogden, Warner St. Paul
Ohage, Justus St. Paul
Ohage, Justus Jr. St. Paul
Ohlinger, L. B. Chicago
Ohnstad, J. L. McIntosh
Oliver, C. I. Graceville
Olson, Albert E. Duluth
Olson, Chas. A. St. Paul
Olson, Chester J. Belle Plaine
Olson, Ernest A. Pine Island
Olson, F. A. Minneapolis
Olson, Olaf A. Minneapolis
Olson, R. G. Minneapolis
Olson, W. P. Gaylord
Onsgard, L. K. Houston
Oppegaard, C. L. Crookston
Oppegaard, M. O. Crookston
Oredson, O. A. Duluth
Orlob, W. M. Jersey City, N. J.
Ormond, Douglas Waconia
Ortman, John W. Pierz
Osburn, Burt F. International Falls
Osborn, Lida Mankato
Ostergren, E. W. St. Paul
Otto, H. C. Frazee
Overend, K. V. Hallock
Owre, Oscar Minneapolis

Page, R. L. St. Charles
Palmer, B. M. Rochester
Palmer, C. F. Albert Lea
Palmer, R. N. Lanesboro
Palmer, W. L. Albert Lea
Paradis, W. G. Crookston
Parker, H. L. Rochester
Parker, O. W. Ely
Parks, A. H. Minneapolis
Parrott, B. W. Long Prairie
Parson, L. R. Elbow Lake
Partch, Wallace T. Rochester
Passer, A. A. Olivia
Patterson, W. E. Westbrook
Patterson, W. E. Minneapolis
Patterson, W. L. Fergus Falls
Paul, L. W. Canby
Paulsen, E. L. Minneapolis
Paulson, T. S. Fergus Falls
Pearce, N. O. Minneapolis
Pearson, William T. Finlayson
Pedersen, A. H. St. Paul
Pederson, Harold Minneapolis
Pederson, O. J. Hanska
Pederson, R. M. Minneapolis
Pemberton, J. deJ. Rochester
Penhall, F. W. Morton
Pennie, D. F. Duluth
Penny, L. E. St. Paul
Peppard, T. A. Minneapolis
Perley, A. E. Philadelphia
Perry, C. G. St. Paul
Perry, Ralph St. J. Minneapolis
Persons, C. E. Marshall
Peters, R. M. Minneapolis
Petersen, J. R. Minneapolis
Petersen, Thorvald Minneapolis
Peterson, A. A. Mora
Peterson, Alfred Dassel
Peterson, Herbert W. Minneapolis
Peterson, Joel A. Rochester
Peterson, Magnus Christian St. Peter
Peterson, O. H. Minneapolis

Peterson, O. L. ..... Cokato
Peterson, R. A. ..... Vesta
Peterson, V. N. ..... St. Paul
Peterson, Willard C. ..... Minneapolis
Petit, L. J. ..... Minneapolis
Petter, Charles K. ..... Oak Terrace
Pettit, C. W. ..... Minneapolis
Pfeffer, Theodore, J. ..... Rochester
Pfunder, M. C. ..... Minneapolis
Phelps, Alvah G. ..... Minneapolis
Phelps, Kenneth A. ..... Minneapolis
Phillips, A. E. ..... Delano
Phillips, W. H. ..... Jordan
Pierce, Chas. H. ..... Wadena
Pierson, Claude M. ..... Wheaton
Piper, M. C. ..... Rochester
Piper, Wm. A. ..... Mountain Lake
Platou, E. S. ..... Minneapolis
Platt, F. Bertram ..... Battle Lake
Plondke, F. J. ..... St. Paul
Plonske, C. J. ..... Faribault
Plummer, H. S. ..... Rochester
Plummer, W. A. ..... Rochester
Poirier, J. A. ..... Forest Lake
Pollard, D. W. ..... Minneapolis
Pollock, L. W. ..... Rochester
Polzak, Jacob A. ..... Minneapolis
Poppe, Fred H. ..... Minneapolis
Porter, O. M. ..... Minneapolis
Portmann, W. C. ..... Jackson
Potter, Edith L. ..... Minneapolis
Powelson, H. C. ..... Rochester
Power, J. E. ..... Duluth
Prangen, A. D. ..... Rochester
Pratt, Fred J. ..... Minneapolis
Pratt, J. A. ..... Minneapolis
Preine, I. A. ..... Minneapolis
Prendergast, H. J. ..... St. Paul
Prescott, Manfred U. ..... Rochester
Prickman, Louis E. ..... Rochester
Priestley, J. T. ..... Rochester
Priestley, Joseph B. ..... Rochester
Prim, J. A. ..... Minneapolis
Pritchard, D. B. ..... Winona
Proshek, Charles E. ..... Minneapolis
Puestow, Charles B. ..... Rochester

Quinby, Thomas F. ..... Minneapolis
Quist, H. W. ..... Minneapolis

Raadquist, C. S. ..... Hibbing
Radabaugh, R. C. ..... Hastings
Radtke, H. P. ..... Rochester
Rains, J. M. ..... Willmar
Raiter, Franklin W. S. ..... Cloquet
Raiter, Roy F. ..... Cloquet
Ramsey, W. R. ..... St. Paul
Randall, Lawrence M. ..... Rochester
Rankin, F. W. ..... Rochester
Ransom, M. L. ..... Hancock
Rapp, E. W. ..... Duluth
Rasmussen, C. C. ..... Fertile
Rathbun, A. M. ..... Rice
Rathbun, C. A. ..... St. Cloud
Rebman, E. C. ..... Austin
Reed, Chas. A. ..... Minneapolis
Rees, S. P. ..... Minneapolis
Regnier, E. A. ..... Minneapolis
Reineke, George F. ..... New Ulm
Reiter, H. W. ..... Shakopee
Rempel, Dietrich D. ..... Brownton
Rentschler, Edwin B. ..... Rochester
Replogle, W. H. ..... Wabasha
Reuter, Maurice Jerome ..... Rochester
Reynolds, J. S. ..... Minneapolis
Richards, E. T. F. ..... St. Paul
Richards, W. B. ..... St. Cloud
Richardson, Fred S. ..... Minneapolis
Richardson, Harold E. ..... St. Paul
Richardson, W. J. ..... Fairmont
Richdorf, L. F. ..... Minneapolis
Ridgway, A. M. ..... Annandale
Ridgway, Alexander ..... Belgrade
Ridgway, Florence ..... Minneapolis
Rieniets, John H. ..... Rochester
Riggs, C. E.* ..... St. Paul
Rigler, Leo G. ..... Minneapolis
Rishmiller, J. H. ..... Minneapolis
Risser, E. D. ..... Winona
Ritchie, H. P. ..... St. Paul
Rivers, A. B. ..... Rochester
Rizer, R. I. ..... Minneapolis
Roadman, I. M. ..... Ponsford
Roan, Carl M. ..... Minneapolis
Robb, Edwin F. ..... Minneapolis
Robbins, C. P. ..... Winona
Roberts, L. M. ..... Little Falls
Roberts, W. B. ..... Minneapolis
Robertson, A. W. ..... Litchfield
Robertson, H. E. ..... Rochester
Robertson, J. B. ..... Cottonwood
Robertson, W. P. ..... Litchfield

*Deceased

Robilliard, C. M. ..... Faribault
Robilliard, W. H. ..... Faribault
Robinson, J. M. ..... Duluth
Robitshek, E. C. ..... Minneapolis
Rochford, W. E. ..... Minneapolis
Rodda, F. C. ..... Minneapolis
Rodgers, C. L. ..... Minneapolis
Roehlke, A. B. ..... Elk River
Rogers, James C. T. ..... Rochester
Rogers, John T. ..... St. Paul
Ronolt, C. L. ..... Waverly
Rood, D. C. ..... Duluth
Rose, J. T. ..... Lakefield
Rosen, S. ..... Minneapolis
Rosenberg, George C. ..... Minneapolis
Rosenberg, Maurice N. ..... Minneapolis
Rosenholtz, Burton ..... St. Paul
Rosenow, E. C. ..... Rochester
Rosenthal, Robert ..... St. Paul
Rosenwald, R. M. ..... Minneapolis
Rothenburg, J. C. ..... Springfield
Rothrock, J. L. ..... St. Paul
Rothschild, H. J. ..... St. Paul
Rousseau, Victor ..... Maple Lake
Roust, H. A. ..... Montevideo
Rowe, O. W. ..... Duluth
Rowles, E. K. ..... Coleraine
Rowntree, L. G. ..... Rochester
Roy, J. A. ..... Red Lake Falls
Roy, Philemon ..... St. Paul
Ruby, Fred McK. ..... Hibbing
Rucker, Charles W. ..... Minneapolis
Rucker, William H. ..... Minneapolis
Rudell, Gustave ..... Minneapolis
Rudie, P. S. ..... Duluth
Ruedemann, Ehrkardt ..... Rochester
Ruhberg, George N. ..... St. Paul
Rumpf, C. W. ..... Faribault
Rumpf, W. H. ..... Faribault
Rumpf, W. H. Jr. ..... St. Cloud
Rutherford, W. C. ..... St. Paul
Rutledge, L. H. ..... Detroit Lakes
Ryan, John J. ..... St. Paul
Ryan, Mark E. ..... St. Paul
Ryan, W. J. ..... Duluth
Rynearson, E. H. ..... Rochester

Sadler, William P. ..... Minneapolis
Saffert, Cornelius A. ..... New Ulm
Sahr, W. G. ..... Hutchinson
Saliterman, B. I. ..... Janesville
Sanderson, E. T. ..... Minneota
Sanford, A. H. ..... Rochester
Satersmoen, Theo. ..... Pelican Rapids
Sather, Allen ..... Fosston
Satterlee, H. W. ..... Lewiston
Satterlund, Victor ..... St. Paul
Savage, F. J. ..... St. Paul
Sawatzky, Wm. A. ..... Minneapolis
Schaaf, F. H. K. ..... Minneapolis
Schacht, Frederick William ..... Rochester
Schaefer, Jos. F. ..... Rochester
Schaefer, S. ..... Winona
Schaefer, Wesley G. ..... Minneapolis
Schatz, F. J. ..... St. Cloud
Scheldrup, N. H. ..... Minneapolis
Scherer, C. A. ..... Duluth
Scherer, Roland G. ..... Morgan
Schlesselman, J. T. ..... Mankato
Schlutz, Frederic ..... Minneapolis
Schmidt, Geo. F. ..... Minneapolis
Schmidt, P. A. ..... Good Thunder
Schmitt, A. F. ..... Minneapolis
Schmitt, O. J. ..... Sterling, Colo.
Schneider, H. A. ..... Jordan
Schoch, J. L. ..... New Ulm
Schoch, R. B. ..... St. Paul
Scholpp, O. W. ..... Hutchinson
Schons, E. ..... St. Paul
Schroeder, C. H. ..... Duluth
Schuldt, F. C. ..... St. Paul
Schultz, J. A. ..... Albert Lea
Schulze, Albert G. ..... St. Paul
Schussler, Otto F. ..... Minneapolis
Schutz, Elmer S. ..... Mountain Lake
Schwartz, Virgil J. ..... Minneapolis
Schwyzer, Arnold ..... St. Paul
Schwyzer, Gustav ..... Minneapolis
Schwyzer, R. ..... Minneapolis
Scofield, C. L. ..... Benson
Scott, D. E. ..... Rochester
Scott, F. H. ..... Minneapolis
Scott, R. A. ..... Detroit Lakes
Seashore, D. E. ..... Duluth
Seashore, Gilbert ..... Minneapolis
Seham, Max ..... Minneapolis
Seifert, Otto J. ..... New Ulm
Selleseth, Iver ..... Minneapolis
Senkler, G. E. ..... St. Paul
Senn, E. W. ..... Owatonna
Sessions, John C. ..... Minneapolis
Setzer, H. J. ..... St. Paul
Shaleen, A. W. ..... Hallock

Shane, James Howard ..... Rochester
Shannon, W. Ray ..... St. Paul
Shannon, S. S. ..... Crosby
Shapiro, E. Z. ..... Duluth
Shaw, A. W. ..... Buhl
Shedlov, A. ..... Fosston
Sheedy, Chester L. ..... Austin
Sheldon, W. D. ..... Rochester
Shelland, J. T. ..... Ada
Shellman, John L. ..... St. Paul
Shelver, H. J. ..... Ortonville
Sheppard, Fred ..... Hutchinson
Sheppard, P. E. ..... Hutchinson
Sherman, C. L. ..... Luverne
Sherman, Carnot H. ..... Philadelphia, Pa.
Sherwood, G. E. ..... Kimball
Shillington, M. A. ..... St. Paul
Shrader, J. S. ..... Springfield
Simison, C. W. ..... Hawley
Simon, B. F. ..... St. Paul
Simons, Bernard H. ..... Chaska
Simons, Edwin J. ..... Swanville
Simons, Jalmar ..... Minneapolis
Simpson, E. D. ..... Minneapolis
Simpson, J. D. ..... Minneapolis
Sinamark, Andrew ..... Hibbing
Siperstein, D. M. ..... Minneapolis
Sivertsen, Ivar ..... Minneapolis
Skinner, H. O. ..... St. Paul
Slater, S. A. ..... Worthington
Slocumb, J. A. ..... Plainview
Slocumb, Maude S. ..... Minneapolis
Slyfield, F. F. ..... Duluth
Smallwood, J. T. ..... Worthington
Smersh, J. F. ..... Owatonna
Smith, Arthur E. ..... Minneapolis
Smith, A. M. ..... Minneapolis
Smith, B. A. ..... Crosby
Smith, B. F. ..... Willmar
Smith, C. M. ..... Duluth
Smith, E. H. ..... Bemidji
Smith, E. K. ..... Duluth
Smith, F. D. ..... Kasson
Smith, F. L. ..... Rochester
Smith, Harry L. ..... Rochester
Smith, Homer R. ..... Minneapolis
Smith, L. G. ..... Montevideo
Smith, Leonard Marshall ..... Rochester
Smith, M. W. ..... Red Wing
Smith, Newton D. ..... Rochester
Smith, Norman S. ..... Minneapolis
Smith, P. A. ..... Faribault
Smith, William M. ..... Rochester
Snell, Albert ..... Rochester
Snyder, G. W. ..... St. Paul
Soderlind, A. ..... Minneapolis
Soderlind, Ragnar T. ..... Minneapolis
Sogge, L. ..... Windom
Sohlberg, Olaf ..... St. Paul
Sohmer, A. E. ..... Mankato
Solhaug, S. B. ..... Minneapolis
Sommer, A. W. ..... Elmore
Souster, B. B. ..... St. Paul
Spannuth, John Roy ..... Rochester
Sprafka, J. M. ..... St. Paul
Spicer, F. W. ..... Duluth
Spratt, C. N. ..... Minneapolis
St. Clair, G. G. ..... Duluth
Stacy, L. J. ..... Rochester
Stangl, Fred ..... St. Cloud
Stangl, Philip E. ..... St. Cloud
Stanley, C. R. ..... Worthington
Stark, W. B. ..... Rochester
Steffens, L. A. ..... Red Wing
Steiner, I. W. ..... Winona
Stelter, Lloyd A. ..... Minneapolis
Stemsrud, A. A. ..... Dawson
Stephan, E. I. ..... Hinckley
Sterner, E. G. ..... St. Paul
Sterner, O. W. ..... St. Paul
Steven, Geo. ..... Byron
Stevens, F. A. ..... Lake Elmo
Stevens, R. B. ..... Rochester
Steward, John Alexander ..... Rochester
Stewart, Alexander ..... St. Paul
Stewart, A. B. ..... Owatonna
Stewart, C. A. ..... Minneapolis
Stewart, C. C. Jr. ..... Rochester
Stewart, Glendolyn ..... Faribault
Stewart, Nelson ..... North Mankato
Stewart, R. I. ..... Minneapolis
Stierle, Adolph, Jr. ..... St. Paul
Stillwell, W. C. ..... Mankato
Stinnette, S. E. ..... St. Paul
Stolpestad, H. L. ..... St. Paul
Stomel, Joseph ..... Minneapolis
Strachauer, A. C. ..... Minneapolis
Strader, E. L. ..... Deerwood
Strand, E. ..... Bayport
Strathern, F. P. ..... St. Peter
Strathern, M. L. ..... Gilbert
Stratte, A. K. ..... Pine City
Stratte, Harold C. ..... Windom

Stratte, J. J. ..... Hallock
Strobel, W. G. ..... Duluth
Strout, E. S. ..... Minneapolis
Strout, G. Elmer ..... Minneapolis
Stryker, W. B. ..... Plainview
Stuart, A. B. ..... Cloquet
Stuhler, Louis C. ..... Rochester
Stuhr, J. W. ..... Stillwater
Sturre, J. R. ..... Minneapolis
Stuurmanns, S. H. ..... Erskine
Sukeforth, L. A. ..... Duluth
Sundt, M. ..... Minneapolis
Sussex, Lloyd Thomas ..... Rochester
Sutherland, C. G. ..... Rochester
Sutherland, H. N. ..... Ely
Sutton, Chas. S. ..... St. Cloud
Sutton, L. F. ..... Mazeppa
Swanson, Cephas ..... Minneapolis
Swanson, Edwin O. ..... St. Paul
Swanson, John A. ..... St. Paul
Swanson, Roy E. ..... Minneapolis
Swart, H. A. ..... Rochester
Swartwood, F. A. ..... Waseca
Swedenburg, A. W. ..... Thief River Falls
Sweetman, R. H. ..... Sauk Center
Sweetser, H. B. ..... Minneapolis
Sweetser, H. B. Jr. ..... Minneapolis
Sweetser, Theodore ..... Minneapolis
Sweitzer, S. E. ..... Minneapolis
Swendseen, Carl G. ..... Minneapolis
Swendson, J. J. ..... St. Paul
Swennes, O. S. ..... Wahkon
Swenson, A. O. ..... Duluth
Swenson, Charles ..... Braham
Swenson, O. J. ..... Waseca
Swezey, B. F. ..... Buffalo

Taft, John O. ..... Minneapolis
Tangen, Geo. M. ..... Canby
Tanner, A. C. ..... Minneapolis
Tanquist, E. J. ..... Alexandria
Taylor, C. W. ..... Duluth
Taylor, H. L. ..... St. Paul
Taylor, Rood ..... Minneapolis
Taylor, Wm. J. ..... Pipestone
Teisberg, C. B. ..... St. Paul
Ternstrom, O. H. ..... Minneapolis
Thabes, John Alois, Jr. ..... Brainerd
Thabes, J. A., Sr. ..... Brainerd
Thomas, Geo. E. ..... Minneapolis
Thomas, Geo. H. ..... Minneapolis
Thomas, Gilbert J. ..... Minneapolis
Thomas, Lester C. ..... Rochester
Thompson, Albert ..... St. James
Thompson, Arthur ..... Raymond
Thompson, Fred Rush ..... Rochester
Thompson, Gershom J. ..... Rochester
Thompson, H. L. ..... Rochester
Thompson, V. C. ..... Marine-on-St. Croix
Thordarson, Theo. ..... Minneota
Thornby, H. J. ..... Moorhead
Thorson, E. O. ..... Luverne
Thorson, Orin P. ..... Northfield
Thysell, F. A. ..... Moorhead
Tibbetts, M. H. ..... Duluth
Tiber, L. J. ..... St. Paul
Tiedemann, Elmer John ..... Adrian
Tierney, C. M. ..... Harmony
Tilderquist, D. L. ..... Duluth
Tingdale, A. C. ..... Minneapolis
Tinkess, Donald Ewing ..... Rochester
Tofte, Josephine ..... Dawson
Torkelson, P. T.* ..... Lyle
Townsend, DeWayne ..... Brooten
Traeger, C. A. ..... Faribault
Traxler, Felix John ..... Henderson
Tregilgas, H. R. ..... South St. Paul
Trimbo, Jos. H. ..... Menahga
Trueman, Harold S. ..... Minneapolis
Truog, Clarence P. ..... Lindstrom
Trutna, Thos. J. ..... Silver Lake
Tunstead, Hugh J. ..... Minneapolis

*Deceased

Tuohy, E. L. ..... Duluth
Turnacliff, D. D. ..... Minneapolis
Turnbull, Robert ..... Fosston
Tweedy, G. J. ..... Winona
Tyrrell, C. C. ..... Minneapolis

Ude, Walter H. ..... Minneapolis
Ulrich, Henry L. ..... Minneapolis
Undine, Clyde A. ..... Minneapolis
Urberg, S. E. ..... Duluth
Urner, John A. ..... Minneapolis

Vaaler, T. ..... Cannon Falls
Vadheim, Alfred L. ..... Tyler
Vail, James B. ..... Henning
Valentine, W. H. ..... Tracy
VanMeier, Henry ..... Stillwater
VanSlyke, Chas. A. ..... St. Paul
VanValkenburg, B. F. ..... Long Prairie
VanValkenburg, F. W. ..... Long Prairie
Vanzant, Frances Ralston ..... Rochester
Verbrugghen, A. H. P. E. ..... Rochester
Vercellini, C. E. ..... Duluth
Vik, A. Elliott ..... Minneapolis
Vik, Melvin ..... Onamia
Vinson, P. P. ..... Rochester
Vivian, R. S. ..... Hibbing
Vogel, Joseph H. ..... New Ulm
Vogtel, Melvin A. ..... Minneapolis
VonderWeyer, Wm. ..... St. Paul
VonLackum, W. H. ..... Rochester
Voyer, Emile O. ..... Minneapolis
Vrooman, F. E. ..... St. Francis

Waas, Charles William ..... St. Paul
Wagener, H. P. ..... Rochester
Wahlquist, Harold F. ..... Minneapolis
Waldron, Carl W. ..... Minneapolis
Waldron, G. W. ..... Rochester
Walker, A. E. ..... Duluth
Walker, G. H. ..... Winona
Walker, Maurice Andrew ..... Rochester
Walker, R. E. ..... St. Paul
Wall, C. R. ..... Minneapolis
Waller, Joseph D. ..... Wilmont
Walters, Waltman ..... Rochester
Wangansteen, Owen H. ..... Minneapolis
Wanous, E. Z. ..... Minneapolis
Ward, A. W. ..... Minneapolis
Ward, Percy A. ..... Minneapolis
Warham, T. T. ..... Minneapolis
Warnock, R. W. ..... St. Paul
Warren, E. L. ..... St. Paul
Warren, F. S. ..... Faribault
Watkins, C. H. ..... Rochester
Watson, A. M. ..... Royalton
Watson, J. A. ..... Minneapolis
Watson, John D. ..... Holdingford
Watson, N. M. ..... Red Lake Falls
Watson, Sydney ..... Worthington
Wattam, G. S. ..... Warren
Webb, R. C. ..... Minneapolis
Webber, Edward E. ..... Duluth
Weber, H. M. ..... Rochester
Weber, M. L. ..... Duluth
Webster, H. E.* ..... Duluth
Webster, William W. ..... Rochester
Weir, J. D. ..... Browns Valley
Weir, J. F. ..... Rochester
Weirick, Howard R. ..... Hibbing
Weiser, Geo. B. ..... New Ulm
Weisman, S. A. ..... Minneapolis
Welch, M. C. ..... St. Paul
Wellbrock, Wm. Louis A. ..... Rochester
Wellcome, J. W. B. ..... Sleepy Eye
Welles, H. J. ..... Minneapolis
Wenner, W. T. ..... St. Cloud
Wentworth, A. J. ..... Mankato
Werner, O. S. ..... Cambridge
Westby, Magnus ..... Madison
Westby, Nels ..... Madison
Westerman, A. E. ..... Montgomery
Westerman, F. C. ..... Montgomery
Wethall, A. G. ..... Minneapolis
Wetherby, Macnider ..... Minneapolis
Weum, T. Wm. ..... Minneapolis
Wheeler, D. W. ..... Duluth
Wheeler, M. W. ..... St. Paul
Wheeler, Theodora ..... Rochester
Whitacre, J. C. ..... St. Paul
Whitcomb, Ed. H. ..... St. Paul
White, J. H. ..... Rochester
White, J. S. ..... St. Paul
White, S. Marx ..... Minneapolis
White, Willard D. ..... Minneapolis
Whitmore, Frank ..... St. Paul
Widen, W. F. ..... Minneapolis
Wieckman, F. H. ..... Sleepy Eye
Wiese, H. F. B. ..... Minneapolis
Wilbur, D. L. ..... Rochester
Wilcox, Archa E. ..... Minneapolis
Wilder, Robert L. ..... Minneapolis
Wilhelmj, Charles Martell ..... Rochester
Wilken, Paul A. ..... Minneapolis
Will, W. W. ..... Bertha
Wilkinson, Stella ..... Duluth
Willcutt, Clarence ..... Minneapolis
Williams, A. B. ..... St. Paul
Williams, Clayton ..... St. Paul
Williams, H. L. ..... Minneapolis
Williams, Henry Lane, Jr. ..... Rochester
Williams, Leon A. ..... Slayton
Williams, Lowell E. ..... Oak Terrace
Williams, R. V. ..... Rushford
Williams, Robert ..... Minneapolis
Williamson, George A. ..... St. Paul
Willius, F. A. ..... Rochester
Wilmot, H. E. ..... Litchfield
Wilson, L. B. ..... Rochester
Wilson, R. H. ..... Winona
Wilson, Warren ..... Northfield
Wilson, W. E. ..... Northfield
Wilson, W. F. ..... Lake City
Wiltrout, I. Geo. ..... Oslo
Winnick, J. B. ..... St. Paul
Winter, J. A. ..... Duluth
Witham, C. A. ..... Minneapolis
Wittich, F. W. ..... Minneapolis
Wohlrabe, A. A. ..... Minneapolis
Wohlrabe, Clarence ..... Springfield
Wohlrabe, E. J. ..... Springfield
Wold, K. C. ..... St. Paul
Wolner, Oscar H. ..... St. Peter
Woltman, H. W. ..... Rochester
Wood, Douglas F. ..... Minneapolis
Wood, H. G. ..... Rochester
Woodruff, C. W. ..... Chatfield
Woodworth, Elizabeth ..... Minneapolis
Workman, H. M. ..... Tracy
Workman, W. G. ..... Tracy
Wray, W. E. ..... Campbell
Wright, C. B. ..... Minneapolis
Wright, Charles D'a ..... Minneapolis
Wright, C. O. ..... Luverne
Wright, Franklin R. ..... Minneapolis
Wright, William C. ..... Rochester
Wunder, Henry E. ..... Shakopee
Wynne, H. M. N. ..... Minneapolis

Yaeger, W. W. ..... Ivanhoe
Yesko, Stephan A. ..... Rochester
Ylvisaker, R. S. ..... Minneapolis
Yoerg, O. W. ..... Minneapolis
Young, T. O. ..... Duluth
Young, V. A. ..... Duluth

Zachman, A. H. ..... Melrose
Zanger, Isabelle M. ..... Minneapolis
Zaworski, E. A. ..... Minneapolis
Zeien, Thos. ..... North Branch
Ziegler, Lloyd Hiram ..... Rochester
Zillessen, Frederick O. ..... Rochester
Zimmerman, H. B. ..... St. Paul
Zinn, Charles J. ..... Rochester
Ziskin, Thomas ..... Minneapolis
Zlatovski, Michael ..... Duluth

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ESSENTIAL HYPERTENSION — PARTICULARLY STRESSING THE SIGNIFICANCE OF DIASTOLIC BLOOD PRESSURE*

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ESSENTIAL hypertension has attracted a great deal of attention during the past decade, and is now generally recognized as a definite clinical entity, being more clearly differentiated from other diseases in which abnormally high blood pressure is a symptom. It was not until 1906 that blood pressure instruments were perfected and simplified so that they might be utilized by the average physician. Life insurance companies early recognized the value of taking the blood pressure, and set about to instruct their examiners as to proper technic and also endeavored to popularize the procedure as a routine measure to be used not only in insurance examinations but clinically as well. It was not, however, until 1918 that the companies realized that the diastolic pressure was as important as the systolic; this being stimulated by the adoption of the auscultatory method which about that time replaced the palpatory method.

In the consideration of the subject of hypertension, we have first to remember that the blood pressure is extremely variable in many individuals. It may vary from month to month, from week to week, and even from hour to hour in some individuals. As a general rule, however, the diastolic will be found to be much more constant than the systolic, and I believe of much more prognostic importance.

Since the technic for taking the systolic measurements was described at a much earlier date than the diastolic, it has, until of late, been the habit with the profession to be complacently satisfied with the taking of the systolic alone. This is unfortunate, and to those who believe the diastolic to be of greater significance, it is rather disappointing to observe how often no mention whatever is made of the diastolic pressure either by research workers or clinicians. An immense amount of study has been done regarding hypertension in large groups of individuals, both in institutions and in clinics. These individuals were studied over long periods of time and with great expenditure of effort, and yet so simple a procedure as to include in these studies the taking of diastolic pressures has been lamentably disregarded. This is unfortunate because in our opinion the information secured from the taking of both systolic and diastolic pressures is of incomparably more value than that which can be obtained by gauging the systolic pressure alone.

Reisman and Weiss in the current number of "American Heart Journal" dismiss the subject of diastolic blood pressure with one short paragraph. "A patient may be considered to be suffering from hypertension who has a diastolic pressure in the neighborhood of 100 mm. hg., though the systolic is only moderately elevated."

We believe that, as we learn more about the dynamics of the circulation, the diastolic pressure will come to be, for prognostic and clinical purposes, paramount in importance. Weiss states:

"Of all the information obtained in blood pressure estimation, the diastolic pressure is the most constant. It is less influenced by such factors as rest, exercise, diet, time of day, etc. When it does vary, the fluctuation is not so great, it gives more reliable information than the systolic or the pulse pressure."

It is unquestionably true that the reason the diastolic pressure was so long ignored is that the technic for taking the systolic measurements

*President's Address read before the Minnesota Academy of Medicine, January 8, 1930.

was described at a much earlier date than that for taking the diastolic and that it has been difficult to obtain proper readings. This has been very evident to insurance companies, whose experience shows that there is no uniformity in technic, some examiners recording their observations at the fourth phase (at the change of sound) and some at the fifth phase (or the disappearance of all sound).

It has been shown that most medical schools teach their students to observe the diastolic pressure at the fourth phase (at the change of sound), but owing to the fact that many physicians have no "tone sense" and that others for various reasons are unable to accurately detect the *change* of sound, it has become an almost universal practice for insurance companies to instruct their examiners to record the diastolic pressure at the disappearance of all sound (fifth phase), for the reason that it is best understood and certainly more generally used.

It is true that whether one or the other phase is used, there is a difference of only about 4 mm. hg. in the average case, but, owing to the attempted exactitude of insurance companies for statistical and practical considerations, this 4 mm. hg. may mean the difference between the rejection or the acceptance of risks which are borderline as to their blood pressure.

Our knowledge of and confidence in the ability of our examiners are very important factors in estimating the value of the readings given. It occasionally happens that very extraordinary pressures are reported such as systolic 130, diastolic 120. This disturbs our confidence in the ability and progressiveness of an examiner much more than it does the question of the insurability of the applicant. Fortunately, the number of physicians recording such impossible readings is rapidly decreasing. I trust I may be pardoned at this time for reviewing the technic concerning the various phases of blood pressure estimations:

First Phase—Is of short duration, often difficult to detect. Sounds are soft and dull.

Second Phase—Extends over a range of from 20 to 60 mm. hg. The quality of the sounds is variable, and it is here the silent gap occurs when present.

Third Phase—Most distinctive phase. Here the sounds are loud and snappy, increasing in intensity to a maximum when they suddenly change to fourth phase.

Fourth Phase—Of short duration; sounds soft and dull.

Fifth Phase—Sounds disappear altogether.

AVERAGE DIASTOLIC PRESSURE

20,735 Cases

Fourth and Fifth Phases

		October 1922 4th Phase	*October 1923 5th Phase*
Age	20	78	73
	25	79	74
	30	80	75
	35	81	76
	40	81	76
	45	82	77
	50	83	78
	55	84	79
	60	85	80

Warfield states "that until recently there was no unanimity of opinion concerning the point where the diastolic pressure should be read." Korotkov himself thought it should be the fourth phase. Fischer, Lang and Manswatona agreed. Ettinger maintained that the end of the fourth phase, or at the disappearance of all sound, was the place to take the diastolic reading. American investigators followed his lead.

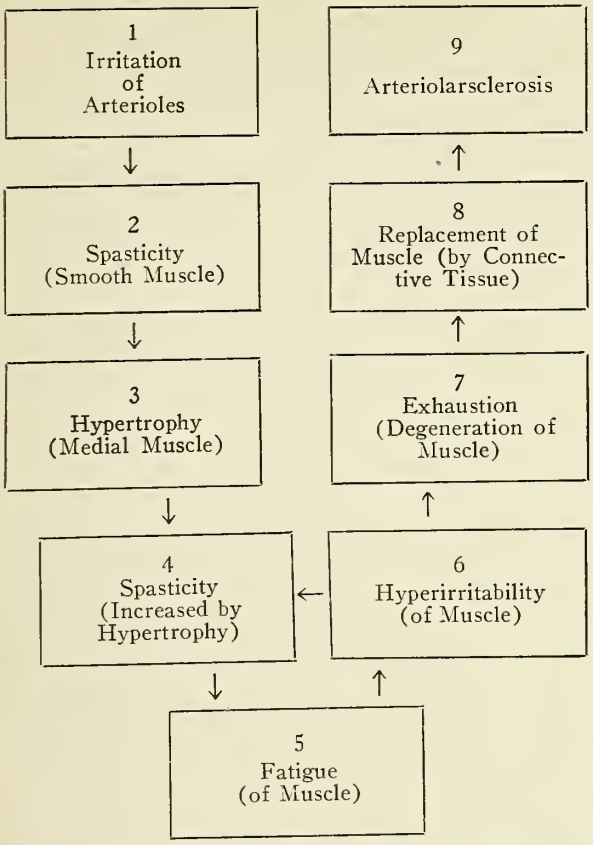
AVERAGE BLOOD PRESSURE

Graduated results for quinquennial ages in group 545,121 cases, showing average systolic and diastolic (fifth phase) pulse pressures.

Age	*Systolic*	*Diastolic*	*Pulse Pressure*
20	120	79	41
25	121	80	41
30	123	81	42
35	124	82	42
40	125	83	42
45	127	84	43
50	129	85	44
55	131	86	45
60	134	87	47

PATHOGENESIS

I have recently been privileged to have presented to me a graphic outline of what I regard as a most lucid illustration of the changes which probably occur in the circulatory system where hypertension exists. The following data were furnished me by Dr. E. J. Stieglitz, who has done a great amount of research work in connection with hypertension, and I feel greatly indebted to him for permitting me to present his theories concerning this phenomena at this time:



The vicious circle of fatigue or the perpetuating factor is represented by steps 4—5—6—4.

BLOOD PRESSURE

The diastolic tension represents the peripheral resistance to the circulation and therefore indirectly is an expression of the tonus of the arterioles. Hypertension is an *arteriolar* disease. The systolic tension represents the diastolic resistance *plus* the force of the left ventricle to overcome this resistance. Therefore, in the absence of thyrotoxicosis or aortic valvular disease a liberal pulse pressure is desirable.

The diagram represents a crude attempt at visualizing the "pathogenesis of the arteriolar changes in hypertension."

Step 1

There occurs *irritation* of the arterioles by almost anything (toxins, protein excess, bacterial poisons, condiments, vasomotor hypertonia, etc.), which results, of course, in

Step 2

Increased tonus or *spasticity* of the smooth muscle of mesial layer of the arterioles.

Step 3

If such increased tonus continues any length of time hypertrophy of the muscle is inevitable, as *hypertrophy follows increased work* anywhere.

Step 4

Because of such hypertrophy, with a continuation of the original irritation, the *spasticity* becomes even more marked.

Step 5

But muscles are *not* adapted to continuous strain, as is well known, and such continuous hypertonia or spasticity leads to *fatigue.*

Step 6

Fatigue (to be sharply differentiated from exhaustion) makes muscle cells more irritable, and *hyperirritability* results.

Such hyperirritability is also seen in the nervous mechanism. We all become cranky, fussy, irritable when very tired. With such a lowered threshold mild irritation or stimulation leads to an exaggerated response of more spasticity.

Thus a *vicious circle* is set up: Steps 4—5—6—4. This is called "The perpetuating factor in hypertension," as it continues to operate, although the original sources of irritation in Step 1 have ceased to exist. It may also be termed "the vicious circle of fatigue."

Step 7

If fatigue continues to *exhaustion,* the muscle cells degenerate, die and fail. Thus simultaneously with the activity of the vicious circle, some cells are slowly exhausted.

Step 8

As these fall by the wayside, replacement with connective tissue takes place; fibrosis occurs.

This is *not* an invasive process or an aggressive cirrhosis; the connective tissue proliferates to support the crumbling framework of the vascular wall as a scaffolding to protect it. Eventually the greater portion of the arteriolar medial muscle is replaced and the final stage is

Step 9

Arteriolarsclerosis.

Up to Step 7 the processes are reversible biologically; fatigue may be relieved by rest, hypertrophy may subside. Beyond Step 7, with fibrotic replacement of *exhausted* muscle, the processes are irreversible and *not* amenable to therapy. Characteristic, of course, of the spastic earlier phases is the variability of the diastolic tension; inversely, after fibrosis occurs, diastolic tension is fixed and rigid. Therefore, we may use the variability of the diastolic tension as an index to the degree of permanent change; the more variable the diastolic tension is, the *less* the actual sclerosis.

Of course, all of these processes are slow and gradual; taking years to develop. Probably in various structures various phases of this procession occur simultaneously, and there is *no* sharp transition between the steps.

ETIOLOGY

The mere fact that the disease has been named essential hypertension is evidence that the cause is unknown. The literature is pregnant with theories as to the cause, but I shall refrain from reviewing this literature so freely referred to in several recent papers on this subject, and state in a general way that the most likely factors in producing this condition are: (1) heredity; (2)

discordant social or business life; (3) strain—mental and emotional; (4) infections and toxic conditions.

It is a fact, as Fahr points out, "that many physicians today still believe that arteriosclerosis is commonly the cause of high blood pressure. Many cases of known high blood pressure show very little or no arteriosclerosis of the palpable vessels nor does arteriosclerosis in itself increase the work of the heart. The term "arteriosclerotic heart" should be reserved for cases with coronary arteriosclerosis." A series of experiments by F. M. Smith and his co-workers led them to conclude that the rate of coronary flow is greatly altered by changes in the diastolic pressure even in the presence of changes in the systolic pressure in the *opposite direction* (i.e., low systolic pressure). They conclude that the maintenance of the essential coronary circulation is fundamentally dependent upon the height of the diastolic pressure and that while the systolic phase of blood pressure may to a certain extent influence the coronary flow, it is certainly subordinate to that of the diastolic pressure in maintaining the coronary circulation. Rountree believes "there is an unknown factor in the etiology which is not understood as yet." He is inclined to the view that "in the beginning at least the arteries are not so much at fault as they are sinned against, chiefly through the vasomotor centers and sympathetic system. Vasoconstriction in hypertension (the physiologic conception of vascular spasm) is replacing, in part, the older idea of anatomic narrowing or fibrosis; both are important, but the vasoconstrictor factor has not received the consideration it merits."

Pines, in a very classical article in the March, 1929, British Journal of Ophthalmology, believes that:

"The systolic blood pressure, although an invaluable part of the clinical picture, can be appreciated correctly only in conjunction with other clinical data. Diastolic pressure bears quite a different significance. It shows the continued pressure and, therefore, the permanent damage to the arterial wall. A continuously raised or, even worse, rising diastolic pressure means a serious prognosis. It does not fluctuate as widely as the systolic pressure; one can rely more upon it. Two men having a diastolic pressure of 130 are both under the sword of Damocles, although they may seem quite well and clinical investigation does not show signs of damage to the kidney. The retina, of course, will show in most cases the true state of affairs."

Kernohan and Keith state that "considerable controversy has existed as to whether any characteristic pathologic lesion is present in the smaller arteries. Interest in the subject was aroused by the ophthamologists being able to demonstrate so frequently a narrowing of the retinal arteries in cases of so-called malignant hypertension."

Recently these same authors have classified essential hypertension clinically into practically three groups:

1. Mild benign shows diastolic under 115 mm. hg.; no impairment of heart or kidney.

2. Severe benign, diastolic *over* 115 with evidences of impairment of vital organs and often with changes in the retina.

3. Malignant hypertension—the diastolic over 130 to 150 or higher, perhaps with marked impairment of vital organs with special changes in the retina and changes in the retinal vessels.

Insurance companies would class all three as decidedly malignant, though many of our examiners do not hesitate to freely recommend risks as first class who qualify as "mild and severe hypertension" candidates.

There is abundant evidence to show that there is at present a definite increase in the morbidity and mortality due to hypertension and its sequelæ, namely: (1) cardiac lesions; (2) apoplexy; (3) coronary diseases. The mortality statistics of life insurance companies show ample evidence of this.

From the mass of data relative to the influence of high blood pressure, there is convincing evidence that excess mortality is a function of degree of departure from normal findings. Clinical evidences, however, are convincing that a certain degree of advanced blood pressure can not in all cases have the same significance with respect to life duration, for the reason that temporary rises in blood pressure occur as a result of various *temporary* factors such as excitement, fatigue and as seen in cases of so-called "high-strung" individuals. We believe, however, that the higher *diastolic* pressure is less influenced by these factors, and when found is very significant. As a general rule when the diastolic pressure is found to have a constant reading of 100 mm. hg., we believe hypertension is present, whether

the systolic is 170 or 140, and a request is then made for further readings, and specimens of urine are submitted and examined at the Home Office laboratory.

O'Hare believes that a persistent diastolic of over 90 at ages under 40, or of 95 at ages over 40 will show a high mortality, and that a diastolic pressure of 100 or more at any age is to be considered pathologic. The persistence of raised diastolic pressure places the patient in danger of three serious sequelæ: (1) heart muscle failure; (2) cerebral hemorrhage; (3) chronic nephritis.

INSURANCE MEDICINE

In 1923 the joint committee on mortality of the Actuarial Society of America and the Association of Life Insurance Medical Directors began to investigate the effects of blood pressure on mortality; this study was completed and published in 1925. As it was not until 1918 that the companies generally required both systolic and diastolic blood pressure readings under printed instructions which were followed by examiners throughout the United States and Canada, no study was made of the subject prior to that year. During the period from 1906 to the present time, there has been a gradual education of physicians and an improvement in the technic of taking blood pressure readings. At first the systolic was taken by the palpatory method. Later it was realized that the auscultatory method was more reliable. It is, therefore, necessary to remember that the conditions under which the readings were taken differed in the various companies and that full information was necessary in order to arrange the data into homogeneous groups. The companies determined for themselves the reliability of the readings. Some took material from cases examined in the large cities by selected physicians. Others from cases examined at the Home Office and in cities where they had medical referees. Still other companies listed examiners who were known to be careful and capable of taking blood pressures accurately, irrespective of whether located in the cities or in the country. These data were contributed by twenty-five of the largest American and five of the largest Canadian companies. From these 707,000 cards (see table) were obtained. It may be said, in passing, that the insurance in force in these companies represented three-fourths of the total insurance carried in the United States and Canada. The last year of issue to be taken was 1920; observation carried to 1924. The objects of the investigation were to determine:

1. The average systolic, diastolic and pulse pressure according to weight and height of men and women.

2. The mortality according to departure from the: (a) average systolic pressure; (b) average diastolic pressure; (c) average pulse pressure.

DISTRIBUTION OF THE CARDS

		707,000 Lives		
(a)	Men—Standard lives	647,000		
	Women " "	53,000		
	Men—Substandard lives	6,500		
	Women " "	500		707,000
(b)	Systolic—Auscultatory	697,000		
	Palpatory	10,000	(all by one company)	707,000
(c)	Diastolic—Fifth phase	500,000		
	Diastolic—Fourth phase	207,000		707,000

It was to be hoped in a study of this kind from life insurance statistics that some reliable data concerning the significance of diastolic blood pressure could be presented, which would be of general interest to the medical profession. We are not at all satisfied with the results of such investigations made thus far, as, owing to the comparatively recent application of the procedure for taking diastolic pressures and the apparent neglect or indifference on the part of the profession to properly evaluate the procedure, not enough time has been allowed to elapse to draw very definite conclusions. Suffice it to state that enough material is at hand to warn medical directors, at least, to fear any case whose diastolic blood pressure hovers around 100 mm. hg. or more, for such cases will undoubtedly show a higher mortality than average.

The Committee says, "While certain conclusions have been developed they do not feel that they should specify the extent to which these are applicable to the selection of individual risks. These conclusions may be briefly stated as follows:

1. The mortality is lower than the average when the systolic or diastolic taken by itself is somewhat below the average, but no information is yet available regarding the effect of *very low* blood pressure. The average blood pressure does not, therefore, appear to be the point of lowest mortality.

2. The good effect of a systolic or diastolic

pressure slightly below the average is likely to be greater at the younger than at the older ages.

3. The mortality increases rapidly with the increase in blood pressure over the average.

4. Substantial departures from the average blood pressure are less significant in the case of pulse pressure than in the case of either systolic or diastolic pressure.

INCREASED MORTALITY OF CASES WITH ELEVATED DIASTOLIC PRESSURE

2,634 Cases

Ratio of Actual to Expected

Group A plus 10 to 16 increase in mm. Hg.....135%
Group B plus 17 to 23 increase in mm. Hg.....188%
Group C plus 24 to 30 increase in mm. Hg.....214%

	Actual Deaths	*Expected*	*Ratio*
Group A	52	38.6	135%
Group B	41	21.8	188%
Group C	24	11.2	214%

Rearranging this Material according to ages at entry:

Age	*Actual Deaths*	*Ratio of Actual to Expected*
15-39	13	115%
40-49	53	221%
50-65	51	140%

A high diastolic pressure is apparently of more importance at the middle ages of life (40-50) than at the younger or older ages.

EQUITABLE EXPERIENCE

9,280 Lives

Issues 1916 to 1924 Inclusive

Group	*Diastolic in Excess of Average for Age*
X	10 to 16 mm.
Y	17 to 23 mm.
Z	24 to 35 mm.

Ratio of Actual to Expected Deaths

Group	*To Age 39*	*Ages 40-49*	*Ages 50 and Over*	*All Ages*
X	89%	100%	89%	93%
Y	77%	199%	97%	112%
Z	52%	177%	145%	130%

CAUSES OF DEATH

Until quite recently it was generally believed that the chief cause of death as a result of hypertension was apoplexy. (Romberg states cerebral hemorrhage or thrombosis causes 45 per cent deaths in hypertension.) Fahr has recently reported that there are 140,000 persons in the United States who die each year from the consequences of high blood pressure, approximately 50 per cent due to cardiac failure consequent upon high blood pressure.

CAUSES OF DEATH

Essential Hypertension

	Heart Disease	*Apoplexy*	*Uremia*	*Miscellaneous (Intercurrent Disease)*
Bell (Myocardial insufficiency including coronary sclerosis)	60%	19.3%	8.5%	11.7%
Christian	32%	25 %	4.5%	37.5%
Granger	52%	31 %	5.5%	11 %

Mortality Investigation of Group 707,000

	9,938 Deaths	*Ratio*
Organic Heart Disease	29%	24
Apoplexy	18%	15
Bright's Disease	14%	12

According to Dr. E. T. Bell, only 10 per cent of hypertension hearts have no demonstrable coronary sclerosis. About 55 per cent show a very moderate degree of arteriosclerosis of the coronaries; 35 per cent of all hypertension hearts have moderately severe to severe arteriosclerosis of the coronary vessels. In these cases there is often very definite degeneration of part of the heart muscle with fibrosis and in these hearts the obstruction to normal volume of blood flow through the heart muscle is a serious handicap to the efficient working of the overworked heart muscle. Should a patient with high blood pressure escape apoplexy or uremia or an intercurrent death from other cause he will surely develop heart failure ultimately.

Prognosis is very difficult to estimate. Some progress rapidly to fatal ending and some live even beyond their normal expectancy of life and then die of some intercurrent disease. The essential factor is the ability of the myocardium and cerebral vessels to withstand the strain of the continued pressure.

The high diastolic pressure is of serious import, as neither the vessels nor the heart seem able to withstand a diastolic pressure of 120 mm. hg. for any great length of time.

SUMMARY AND CONCLUSIONS

1. The importance of diastolic blood pressure is seemingly not sufficiently emphasized or its significance appreciated by the profession at large.

2. Arteriolosclerosis is not an invasive process, or an aggressive sclerosis, but a replacement of muscle tissue by connective tissue—a fibrosis.

3. We would be inclined to believe that every case showing a constant diastolic blood pressure of 115 mm. hg. or over, is potentially, at least, a case of malignant hypertension.

4. Many cases of so-called "heart deaths" can be attributed to arteriolarsclerosis and are responsible to a large degree for the high mortality in the fourth and fifth decades of life. Insurance statistics show a decided rise in mortality at the ages of 40 to 50 from "heart deaths."

5. Persistent diastolic blood pressure of over 90 mm. hg., at ages under 40, or 95 mm. hg. at ages over 45, will show a higher mortality than normal.

ULCERATIVE COLITIS AS A COMPLICATION OF ABDOMINAL OPERATIONS*

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A DEFINITE or even a likely explanation of the cause of postoperative diarrhea rarely can be given. There are times when the condition becomes intractable. Diligent search of the numerous watery, sometimes lienteric stools, fails to reveal organisms of dysentery, typhoid fever, paratyphoid fever, or of any of the Gram-negative bacteria associated with intestinal disease. Likewise, search for parasites of all kinds proves fruitless. Usually there has been normal postoperative convalescence for the first four to six days, or even for a week, with the usual postoperative rise in temperature with subsequent return to normal and, then without demonstrable other break in the postoperative course, the patient has complained of abdominal cramps and has begun to pass loose stools. At first three to four stools have been passed in twenty-four hours, then gradually the number has increased to many rectal discharges in twenty-four hours, usually watery and mixed with pus. When this stage has been reached, occult blood soon appears, but gross blood in noteworthy quantities rarely is recognized. Occasionally the stools are streaked with blood. The patient gradually fails, he has great difficulty in retaining food or drink, and consequently the intake of calories by mouth is substantially reduced. Moreover, he becomes steadily depleted by the frequent rectal emissions. There may be a subsequent rise in temperature, but there is just as likely to be an afebrile course, or the temperature may even sink to subnormal levels. Failure is progressive, and finally death occurs. At no time since the onset of the diarrhea has there been a suitable opportunity for proctoscopic investigation, nor has the patient's condition been favorable for such a maneuver.

*Submitted for publication March 26, 1930.

The observation of several such cases prompted us to inquire into the frequency of this complication, and twelve cases were found in the necropsy records of The Mayo Clinic in the years 1922 to 1929, inclusive, or an average of a case and a half a year, in a total of approximately 65,683 major abdominal operations (tabulation). Four reports of illustrative cases follow:

Case 1 (Case 2 in the tabulation).—A woman, aged fifty-two years, the wife of a farmer, came to the clinic October 25, 1923, complaining of gastric trouble of thirty-two years' duration. She never had felt well in these thirty-two years, but with her attacks of indigestion her condition was worse. At such times, she had gas, belching, sour stomach, nausea, and a dull, aching pain in the epigastrium an hour after eating. Occasionally there was emesis, but never of blood. The condition gradually had become worse. She had taken many kinds of medicine, with temporary relief. Taking of soda used to relieve her. In the few months preceding her admission to the clinic, she had had three very severe attacks. She had lived on a bland diet for some time.

On admission, the patient's weight, which had been 130 pounds five years before, was 100 pounds. The blood pressure in millimeters of mercury was 94 systolic and 60 diastolic. The numbers of leukocytes and erythrocytes were within normal limits. Roentgenograms of the stomach gave evidence of a gastric ulcer. Examination otherwise gave essentially negative results.

November 5, 1923, knife excision of the ulcer, and posterior gastro-enterostomy was done. About the seventh day after operation intermittent vomiting began. The vomiting was worse after the thirteenth day. It was found that very little was passing through the stomach. The urinary output fell, and the blood urea rose to 126 mg. in each 100 c.c. On the seventeenth postoperative day, jejunostomy was performed. Everything seemed in good condition about the opening made at gastro-enterostomy. There was some angulation of the duodenum, which was adherent to the anterior abdominal wall; this was released. Failure was progressive and the patient died on the fifth day after the jejunostomy.

At necropsy ulcerative colitis, with perforations in the

sigmoid portion of the colon, terminal local peritonitis, and an old, healed duodenal ulcer were found.

Case 2 (Case 3 in the tabulation).—A man, aged fifty-nine years, a farmer, came to the clinic August 19, 1929, with a history of epigastric distress for ten or twelve years. This distress consisted of a feeling of fullness which came between one and two hours after meals, and lasted about an hour. Application of heat would relieve him; taking of food would not. There was some pyrosis. The attacks would be worse in the fall of the year. There had been no visible blood in the stools. The bowels had moved normally.

The patient appeared sallow, and had lost 20 pounds in weight. There was some sense of resistance in the epigastrium. Otherwise examination gave negative results. The numbers of erythrocytes and of leukocytes were within normal limits. Roentgenograms of the stomach gave evidence of an ulcer on the lesser curvature, fairly high in the stomach.

August 24, partial gastrectomy of the posterior Polya type was done, and a perforating ulcer of the stomach was found. For the first three days after operation the patient's condition was good; his maximal temperature was 100.8° F. On the fourth day he had eight stools in twenty-four hours; on the fifth day, eighteen stools, and from then on persisted intractable, continuous diarrhea. The patient had no desire to eat, and refused food. Solution of glucose was given intravenously, and finally nasal feeding was resorted to. He died September 21, from subacute ulcerative colitis, involving the entire colon.

Case 3 (Case 5 in the tabulation).—A man, aged sixty-three years, a farmer, came to the clinic in December, 1928, with a history of attacks of distress in the upper part of the abdomen of eight years' duration, characterized as spells of indigestion. He had hunger pains at bedtime, which were relieved by taking milk and crackers before retiring. During the harvesting season he had been accustomed to eating a heavy meal about 8:00 p. m. and would begin to have a burning type of distress, with much belching, about 2:00 a. m., which was relieved by drinking milk and eating crackers. He would also have distress in the afternoon, particularly after eating a large noonday meal. This would be relieved by eating something, or would continue until the evening meal. In the few years previous to his coming to the clinic the distress had come in cycles, lasting about a month at a time, with intervals of six to nine months of freedom. A few months before admission, the nocturnal distress had become more noticeable. There had been occasional emesis. There never had been any real colic in the upper part of the abdomen, although he recalled that for twenty years he had had some indigestion, but for the first twelve years it had not been as marked as it had been in the last eight years.

General examination revealed that the patient weighed 40 pounds less than what he said he had weighed five months before admission. The only thing of note in the blood count was that leukocytes numbered 12,000 in each cubic millimeter. Analysis of gastric content disclosed total acidity of 26 and free hydrochloric acid of 22 (100 c.c. of gastric content neutralized by 2.6 c.c. and 2.2 c.c., respectively, of tenth-normal sodium hydroxide). By aspiration, 110 c.c. of the test meal was recovered. Roentgenologic study of the gallbladder showed it to be functioning normally, and similar study of the stomach revealed a defect of a duodenal ulcer. The patient was hospitalized and further studies were suggested. Along with the gastric distress, there had been symptoms suggesting gallbladder colic.

Exploration, March 4, 1929, revealed adhesions around the duodenum, biliary cirrhosis, and a choledocholith. Choledocholithotomy and choledochostomy were performed. Convalesence was uneventful and the patient was dismissed from the hospital, March 18. It was noted, however, that on the ninth day of his stay in the hospital he had six loose, watery stools. This was six days before dismissal, although in those six days his stools had continued to be loose.

The patient returned, April 3, stating that his diarrhea had become worse a few days after leaving the hospital and had progressively increased in severity. On admission, the patient looked very ill, had a temperature of 100° F. with some abdominal distention and tympany, and marked tenderness along the line of the colon. The question of an obstructive lesion, with peritonitis, was raised. Failure was very rapid and death followed on the third day after readmission to the hospital. The anatomic diagnosis was acute, severe, ulcerative colitis.

Case 4 (Case 11 in the tabulation).—A woman, aged fifty-six years, came to the clinic March 9, 1927. A diagnosis of pelvic abdominal tumor was made and exploration was undertaken, March 13. Carcinoma of the right ovary, involving the uterus and anterior wall of the sigmoid colon, was found, for which bilateral oöphorectomy and salpingectomy, subtotal abdominal hysterectomy, and resection of a portion of the sigmoid, and colostomy were done. The pathologist reported squamous-cell epithelioma, graded 4. The patient made an uneventful convalescence and was dismissed from the hospital on the twenty-sixth day after operation, with an afebrile temperature and feeling fairly well. The last eighteen days of her stay in the hospital, however, there had been diarrhea, which had reached its maximum five days before dismissal, and the last few days it had seemed to be controlled by paregoric and bismuth. However, after the patient had left the hospital, the diarrhea had continued, and had become steadily worse, so that she returned to the hospital, June 30, four days after dismissal. From then on her condition became progressively worse, and she lost weight rapidly. In spite of the use of tincture of opium, tincture of iodine, paregoric, and other symptomatic agents, her failure was progressive and she died, July 10. The anatomic diagnosis was metastasis to the pelvic and abdominal aortic nodes, ulcerative colitis, graded 3, and pelvic abscess.

COMMENT

An interesting question arises concerning possible etiology of severe fulminating, fatal colitis, and its incidence after operation on the

DATA CONCERNING ULCERATIVE COLITIS AS A COMPLICATION FOLLOWING ABDOMINAL OPERATION

Case	Age, years, and sex	Diagnosis	Surgical procedure	Time of onset of diarrhea, days after operation	Death, days after operation	Cause of death
1	67M	Gastric ulcer (perforating)	Closure of perforation; drainage of abdomen	5	53	Ulcerative colitis; abdominal abscesses
2*	52F	Gastric ulcer	Knife excision; gastro-enterostomy	13	22	Ulcerative colitis; perforation of sigmoid
3*	59M	Gastric ulcer	Partial gastrectomy of posterior Polya type	4	29	Ulcerative colitis
4	50F	Subacute duodenal ulcer (perforating)	Posterior gastro-enterostomy	5	13	Ulcerative colitis
5*	63M	Choledocholith; biliary cirrhosis	Choledocholithotomy and choledochostomy	9	33	Acute ulcerative colitis
6	38F	Carcinoma of pylorus	Jejunostomy for inoperable obstructive carcinoma	3	9	Ulcerative colitis; beginning peritonitis
7	65M	Carcinoma of pylorus	Billroth 2 resection; posterior gastro-enterostomy	5	9	Ulcerative colitis; peritonitis; bronchopneumonia
8	62F	Intestinal obstruction	Cecostomy	Diarrhea first few days of illness	6	Acute ulcerative colitis; diverticulitis of sigmoid with obstruction
9	23F	Right tuboövarian abscess; left pyosalpingitis; subacute appendicitis	Right salpingo-oöphorectomy and left salpingectomy; appendectomy	6	22	Chronic ulcerative colitis; chronic ulcers of stomach; multiple loculate abscesses in peritoneal cavity
10	55F	Choledocholithiasis with biliary fistula; cholecystitis, graded 2	Choledochostomy; cholecystectomy	6	39	Ulcerative colitis; internal hemorrhagic pachymeningitis
11*	56F	Carcinoma of ovary fixed to sigmoid and uterus	Hysterectomy; oöphorectomy; resection of part of sigmoid; colostomy	8	58	Ulcerative colitis, graded 3; pelvic abscess
12	57F	Ovarian cyst	Right salpingo-oöphorectomy; appendectomy	6	17	Ulcerative colitis, graded 3; general peritonitis

*Reported in text of article.

upper part of the abdomen. It will be noted that in eight of the twelve cases (tabulation) operation was on the stomach or biliary passages, and in six of these operation was primarily on the stomach. In three of the cases, there were pelvic operations; in only one case was operation primarily on the large intestine, and that in a case of long-standing obstruction. The possibility of the occasional, or frequent, presence of organisms, either in the lumen or the wall of a diseased viscus must be borne in mind. Whether or not similar or closely related organisms occur in peptic, cholecystic and intestinal ulcers is not known. Rosenow,[3,4] frequently has isolated strains of streptococci from peptic ulcers and infected gallbladders, and many workers, including one of us (Bargen[1]), have found a diplostreptococcus in the ulcers of chronic ulcerative colitis. How closely these various organisms are related has not been determined. We have called attention to the occasional existence in the same person of peptic ulcer and chronic ulcerative colitis, and to the subsidence of the symptoms of the former with the treatment of the latter.

Also it should be noted that in 1929 two patients, whose condition clinically was like that of the twelve reported, on empiric grounds were given the specific immune chronic ulcerative colitis antibody solution[2] and recovered.

For those who might consider ulcerative lesions of the colon of this type to be on a metabolic basis, an answer would seem to lie in the rapid course which these cases followed. All of the patients seemed to represent average surgical risks except the one who had intestinal obstruction. True, all but two of the patients were between the ages of fifty and sixty-seven years, but in seven the results of blood counts were negative and in only one patient (case 10) was there noteworthy anemia, the concentration of hemoglobin being 37 per cent (Dare) and erythrocytes numbering 2,540,000 in each cubic millimeter of blood. Most of the patients had lost considerable weight; in case 6 the loss had been 60 pounds; in case 7, 24 pounds; in case 9, 30 pounds; in case 10, 30 pounds, and in case 4, 40 pounds; except for these factors, the preoperative condition of the patients was favorable. Furthermore, none of the patients had been exposed, either before or after operation, to any of the usual bacteria generally recognized as causing dysentery.

It would seem, then, that the causative factor was present at the time of the patient's operation and that postoperatively certain other factors were brought into play to cause the etiologic agent to become active.

SUMMARY AND CONCLUSIONS

Severe postoperative diarrhea, if it is found not to be due to any of the usually recognized causes of dysentery, may be of the type of chronic ulcerative colitis and can justly be treated as such.

As long as the cause remains obscure and the case is fulminating, and therefore adequate means of investigation of the cause are difficult to apply, any measures of combating the condition may be judiciously undertaken. The great value has been demonstrated of specific antibody solution prepared from immune horse serum in cases of chronic ulcerative colitis in which the etiologic agent, apparently, is the diplostreptococcus.[2] It seems reasonable, therefore, to include administration of this antibody solution in the therapeutic measures, or perhaps to think of it as the most effective of them. If the case does not yield promptly to this, ileostomy, with short-circuiting of the fecal stream, may be indicated. This operation has found favor in refractory or complicated cases of bacterial chronic ulcerative colitis and may be a life-saving measure.

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PERNICIOUS ANEMIA: AN HISTORICAL SUMMARY WITH ESPECIAL REFERENCE TO THE OCCURRENCE OF FEVER

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THE late Charles Lyman Greene[1] has defined Addisonian Pernicious Anemia as follows: "This is a primary anemia, probably invariably fatal, progressing slowly by remission and relapse, characterized by hemolysis and perverted hemogenesis associated with progressive and ultimately fatal extreme diminution in the number of erythrocytes in the circulating blood, the appearance of large numbers of immature red blood cells and a marked reduction in the hemoglobin with a relatively high individual cell hemoglobin content which results in a high color index." This gives a very clear idea of the anemia side of the disease, but we wish to emphasize in this paper that Addison's anemia consists not only of the anemia but of certain changes in the gastro-intestinal tract, and usually in the central nervous system. We believe that Dr. Greene's definition could be rendered more inclusive if it is specified that the presence of an achlorhydria is an essential invariable finding, in addition to which there is usually anatomical evidence of the existence of a glossitis. Furthermore, evidence at hand is conclusive that at least 80 per cent of the sufferers with this disease present signs and symptoms indicative of degenerative changes in the posterior and lateral columns of the spinal cord.

HISTORY

Osler, we believe, is credited with the statement, "Know syphilis and you know medicine." While perhaps not quite so true with regard to pernicious anemia, one can truly say, "Know pernicious anemia and know more medicine." The progress of our gain in knowledge concerning pernicious anemia has been very slow with the exception of two periods, that of the present and that from 1870 to 1880.

Coombe[2] of Edinburgh was the first to recognize the existence of this peculiar anemia as an individual disease, and it is very interesting to read that this canny Scot viewed it as "a peculiar disease, which will doubtless be viewed in different appellations." His prophecy has certainly been many times fulfilled. The next case to be recorded in the literature is that of Channing[3] of Boston, edited in 1842 in the New England Quarterly Medical Journal. There is very good evidence that the existence of an anemia of unknown cause and pathology, invariably fatal, had been recognized by the Boston clinicians for ten or fifteen years prior to this. Unfortunately for the credit of American medicine, however, they failed to differentiate it either from the anemia subsequent to multiple pregnancies or from the anemia of pregnancy. When we consider, however, that the so-called primary, or severe anemia of pregnancy is not as yet clearly differentiated from Addisonian anemia we need feel no especial chagrin at their failure.

These remain the two instances of this disease in the literature up to the time that Addison[4] first gave his now famous dissertation upon the disease of the suprarenal bodies in 1849. At this time, while recognizing that some of his cases did not have demonstrable pathology of these organs, it was not till his later publication[5] in 1855 that he clearly differentiated the two conditions, the one of the suprarenal bodies being now called Addison's disease, and the other idiopathic anemia being referred to as Addison's anemia.* Apparently, as is common in medical circles, attention was paid to the disease with manifest pathology but it is not until 1871 that we again find this idiopathic anemia receiving its share of the limelight.

In this period of twenty years I am able to find only one article of any detail, that of Habershon,[6] published in the Lancet of 1863. In a lecture on anemias he reported, with other cases,

*Attention should be called to the description of a fatal case of anemia corresponding in type to that described by Addison, published by Barclay[7] in 1851.

that of a woman, aged 40, in whom the disease had a gradual onset with weakness, a yellowish pallor, and with gastro-intestinal symptoms of pain, occasional nausea and emesis, alternating constipation and diarrhea, but, withal, not accompanied with cachectic wasting. The white blood cells were not increased in number. The postmortem examination was negative except for a fatty degeneration of the heart, especially prominent in the walls of the left ventricle. The state of the knowledge of this affection in 1870 seems to me to be well represented in Austin Flint's Principles and Practice of Medicine[8] (1868). He stated: "Addison has described cases of anemia occurring without any obvious causation, accompanied by general debility which progressively increases, at length ending fatally, without appreciable lesions of any of the vital organs. Cases of this kind are occasionally met with, especially in hospital practice. Addison distinguishes them as cases of 'idiopathic fatal anemia.' In a certain proportion of these cases the surface of the body, to a greater or a lesser extent, assumes a dark discoloration or a bronzed appearance, and in several successive cases the suprarenal capsules were found to be more or less disorganized. Addison inferred from these facts a pathological connection between disease of the suprarenal capsules and the bronzed hue of the skin. Clinical observation, however, shows that the two events are not uniformly associated." Certainly there remained much to be done, before the idiopathic anemia was to be firmly founded as a clinical entity.

With the increasing prominence of the Teutonic medical centers we find pernicious anemia re-discovered. The first paper on the subject then was that of Gusserow,[9] in Zurich. He reported five cases of severe anemia in pregnancy or the puerperium. The true value of these cases is doubtful. But in the following year, a colleague of his, Biermer,[10] published the paper which gave the impetus to the diagnosis and investigation of this disease. He claimed to have seen fifteen cases in five years, which at once placed the disease among the less common, instead of among the little known rarities. While one may doubt the authenticity of several of his cases, one can not doubt that, aside from the neurological aspect, he clearly recognized all the symptoms of Addisonian anemia. To quote from his paper in regard to the etiology: "Miserly and improper food, bad rooms, dehydration, especially protracted diarrhea, foster the progress of the disease and cause it." Such a viewpoint expressed today would classify the disease as a deficiency disorder. His division of the symptoms and their interpretation is no less modern. He classified them into eight groups: "1. Anemia-hydremic phenomena: great pallor, poor nutrition, but no atrophy of the fat cushions such as occurs in carcinoma and phthisis. Often a yellowish white facial color without jaundice. In far advanced cases, moderate edema-like puffiness of the lower eyelids, and feet and hands, occasionally ascites. 2. The corresponding anemia nerve symptoms: weakness, faintness, palpitation of the heart, etc. 3. Digestive disturbances, the sequences of the fatal loss of appetite: poor digestion, sometimes the feeling of pressure in the stomach; very often intermittent diarrhea. 4. Circulatory symptoms—murmurs in the heart and blood vessels, very often so loud that one must question the existence of a cardiac defect. The murmurs are systolic, though occasionally there is a diastolic in addition without a degeneration of the valve being found at post-mortem: at the base the systolic murmur is rougher than over the ventricle, where it is more blowing. . . . The heart action is as a rule hastened, and the heart sounds diffuse, undulating and not vigorous. 5. Fever is uncertain; however, it is observed transitorily in nearly all cases. . . . Distinctly local basis for the fever cannot be found. 6. The retinal hemorrhages are interesting because they are almost constant. 7. Occasionally there were cutaneous hemorrhages, small petechia. Hematuria and epistaxis are occasionally observed, albuminuria only exceptionally. 8. On the contrary, capillary hemorrhages in the brain, on the arachnoid side of the dura, and in the pia, were found in several cases without characteristic symptoms during life. . . . All cases ended in death, with one exception, which was slightly improved." For a clinical description of the appearance of the patient, this could be regarded as entirely up to date with the exception of the neurological findings and the glossitis. At necropsy Biermer found only a moderate fatty degeneration of the heart, especially under the endocardium lining the left ventricle, and what he termed "fatty degeneration of the capillaries" by which he explained the capillary hemorrhages throughout the

body. Why this paper, which is in reality very short, brought the disease into general notice and gave the impetus for the great increase of knowledge which came about in the next ten years, is unexplained. That is just what happened, however, especially in Germany, where the disease is known as Biermer's anemia, and, we believe, justly.

Two years later, Quincke's article[11] appeared, and contained the first glimmering of knowledge concerning the pathological physiology of the disease. By the ferrocyanide test, he was able to demonstrate, grossly and microscopically, the presence of a substance giving the iron reaction in the liver, kidneys, and pancreas. This he verified by chemical analysis, which showed conclusively that there was an increase of iron. Quincke failed to grasp the entire importance of this, which we now know under the name of hemosiderosis, for he thought that possibly this storage of iron could be accounted for on the basis of that found in the medicine that had been administered. In the same year, 1874, Immerman[12] published an extensive dissertation on the subject, in which, however, he added nothing new. Eichhorst[13] in Leipzig in 1874 and again in 1884 was the first to call attention to the peculiar shape of the red blood cells in what he called Biermer's anemia. We in America should be proud that the year 1875 saw the publication of an extensive review of this disease by Pepper,[14] and to him should belong the credit of first clearly describing the replacement of the yellow marrow of the long bones by red marrow consisting of distinctly blood forming elements. He was also the first to mention arsenic in the treatment of the malady. Cohnheim[15] in Germany in the following year confirmed, independently of Pepper, the replacement of the yellow by red marrow, as did Lepert[16] in Paris. The year 1877 was notable for the contribution of Scotland, in the form of a case report by Bramwell[17] of Edinburgh, in which for the first time the presence of nucleated red cells was recognized, clearly described, and well illustrated. Previous to this, while changes in shape had been recognized as common to this condition, nucleated erythrocytes had never been described. Bramwell also brought before the English and continental physicians the value of arsenic in this malady, since the two cases in which he used it recovered. Bramwell possessed true Scottish caution, however, for we find him making this statement, "Although the results were all that could be wished for, I would not for a moment have it supposed that arsenic will be found a specific for this disease."

While such rapid strides were being made in the understanding of blood conditions, gastroenterology had begun to develop. In 1870, we find that Samuel Fenwick[18] had reported a case of primary gastric atrophy. Upon reading his case report, one finds that he was in reality describing pernicious anemia, and that he had most beautifully demonstrated the existence of achylia by experimental means. We can do no better than quote his remarks: "It is well known that an infusion of the gastric mucous membrane when mixed with dilute hydrochloric acid will dissolve albuminous substances; and I have found, by numerous experiments, that one ounce of such an infusion will on the average digest four grains of hard-boiled white of egg. I carefully scraped off the mucous membrane from the splenic and middle regions of the stomach in the preceding case, and infused it in two ounces of distilled water, along with half a dram of dilute hydrochloric acid for twelve hours. A cube of hard boiled white of egg, fifteen grains in weight, was then digested for nine hours at blood heat, but at the end of this period, the albumin had not lost in weight, and the only change produced was a slight softening on its surface. This experiment, therefore, confirmed the conclusion drawn from the microscopical examination, that the gland-structure of the stomach had been so seriously diseased that it could not have been capable of performing its functions during life." Austin Flint[19] of Philadelphia in the following year reviewed Fenwick's paper and added four cases of his own, all fairly typical of Addisonian anemia. In these cases he followed Fenwick's lead and diagnosed primary gastrict atrophy. Fenwick[20] in 1877 reopened the subject with a paper in which were reported seven cases, four with necropsy. These were all typical of Addisonian anemia, and he seems to have been aware at least of the similarity; nevertheless he attributed the accompanying anemia, perhaps correctly, to the gastric glandular atrophy which he had so beautifully demonstrated.

Thus the first great period of activity in research upon this subject was brought to a close with the appearance early in the 80's of two ex-

haustive reviews of the subject in English, the first by Coupland[21] in 1881, and the second by Pye-Smith[22] in the following year. We believe the two are equally exhaustive and reliable, but we find that the second is readable, whereas the one by Coupland is written in a style both difficult to follow, and not clear as to points of emphasis. The first point to impress the American reader in both articles is that the British ire had been aroused at Biermer's claim to have discovered the disease, and both authors wrote insistently and at length on the priority of Coomb and Addison. Coupland tried to incorporate pernicious anemia as a special kind of chlorosis, but seems to us to have failed, most miserably. Pye-Smith was thoroughly imbued with Guy's hospital spirit, and would permit no one to usurp Addison's priority in the description of a new clinical entity. Both papers admirably summed up the knowledge to date.

The period from 1880 to 1926 was one devoted to the proof and amplification of the signs and morbid changes observed in the era preceding it. It was in this period that we had the development of the aniline dyes by Ehrlich,[23] with its corollary, a great advance in the knowledge of cellular detail. By this means we not only had the work of Eichhorst and Bramwell confirmed, but we had the recognition and the anatomical description of the two types of erythrocytic development, i.e., the adult normoblastic one and the embryonic or pathologic megaloblastic type. It was in this same period, also, that it was conclusively demonstrated that megalocytes and megaloblasts are only found in primary anemia. Following this came the work of Price-Jones,[24] another Guy's hospital enthusiast, who measured the size of the red cells in normal individuals and in persons suffering from the various types of anemia. By this method, he gave us another diagnostic criterion in Addisonian anemia. He found it to be pathognomonic of this condition for the red cells to show two distinct variations in size from that of normal blood, or that of blood from the other anemias. The first and most important is that the average diameter, instead of being 7.5 micra as it is with normal individuals, or less as it is with hemolytic jaundice, is increased to 8.5 or even 9.5 micra. This is certainly a well marked difference. The second pathognomonic variation that he observed was in the range of the size of the cells; whereas in normal blood the size may run from 6.5 to 8.5 micra, in pernicious anemia a range from 4.5 to even 11 or 12 micra is the rule. This does not occur in any other form of anemia.

Along with the increase in our knowledge of the histopathology of the blood, we find occurring an increase of interest in the study of the bone marrow changes. Beginning with a paper in the 80's by Osler and Gardner[25] various observers[26] noticed the distribution and the appearances of the red marrow, till we have in a paper by Peabody,[27] of Boston, the culmination of such studies. He and his associates in Boston developed a technic in which, by means of local anesthesia, they trephined through the shaft of the tibia and curretted out a small portion of the marrow for histological examination. The value of this lay in the reporting of the condition of the marrow during life and not after the person succumbed to the disease; thus he was enabled to get marrow from all stages of relapses and remissions. He stated that from their necropsy observations they believed that the replacement of the yellow by red marrow took place first in the bones of the trunk, next in the femurs and humeri, and lastly in the legs and forearms; while in a remission the opposite was true, the red marrow disappeared first from the bones most distal from the trunk, and only in a complete remission were absent from the vertebræ, ribs, etc. Hence, a biopsy from the tibia gave the most sensitive index of the stage of the disease. He found that during a relapse the fat practically disappeared to be replaced by hemopoietic tissue, consisting largely of columns and cords of megakaryocytes, some of the myeloid series, and a few of the normoblastic type. Mitoses were rare in the latter, occasionally found in the myelocytes but exceedingly numerous among the megakaryocytes. The hyperplasia was so extensive that the venous sinusoids were practically collapsed. Their outlines were distinguished only by the aid of the hemosiderin granules contained in their walls. In the beginning of a remission there was a distinct difference in the picture; crowding was not so intense, and the preponderance of mitoses had shifted from that of the megakaryocytic series to that of the normoblasts. When a remission was well established, the fat cells had returned and occupied the larger part of the space normally theirs. Even when the remission was practically

complete, however, cords of megakaryocytes existed among the fat cells, though mitotic figures among them were conspicuous by their absence. The conclusion to be reached from this seemed to be that, though the organism had largely returned to the normal method of blood manufacture, the possibility of reversion to pathologic type was ever present.

Of the two additional morbid changes that have been described since 1880, that of the central nervous system holds the priority. Lichtheim[28] in 1887 described changes in the posterior and lateral columns of the spinal cord in three cases of severe anemia. This was shortly followed by three additional cases described by Minnich.[29] Later the spinal cords of twelve additional cases of Addisonian anemia were examined by Minnich, and, though they had not complained of neurological disturbances during life, the same type of change, though not to the same extent, was found to occur in their cords. In 1895, Bowman[31] collected the literature and with his own case was able to find eleven Addisonian anemia patients who had complained of distinctly neurological symptoms during life. Bowman's description of the gross changes is as accurate today as it was when he wrote it, thirty years ago. "In every instance there was degeneration in the posterior columns, most marked in Goll's tract, but also involving more or less of the posterior-external columns; but in the latter case leaving a strip of undegenerated white matter on the inner surface of the posterior gray cornu. The posterior roots and Lissauer's tract were invariably intact. In four instances (66 per cent) the lateral columns were also affected, the degeneration being situated chiefly in the outer and posterior portion, and in three of these cases similar changes were also observed in the anterior columns, chiefly in the situation of the direct pyramidal tracts."

Since that time, neurological signs have been increasingly looked for, so that now in at least 80 per cent of the cases they are reported as being present.[31,32] The location of maximum areas of destruction as occurring in the lower cervical and upper thoracic levels of the cord have since this time been abundantly confirmed. The best description[33] that we have been able to find of the histology of the process is as follows: "The microscopical details are typical in that they begin around and spread from the vessels . . . Beginning as small lesions, these latter coalesce in such a manner as to give the cord a cribriform appearance." In 1923, Woltman[32] of the Mayo Clinic gave a paper on the mental changes found in pernicious anemia. He agreed with Barrett[34] that lesions similar to those described in the cord did occur in the brain. Furthermore, Woltman found that 4 per cent of the cases of pernicious anemia that came to the Mayo Clinic had a more or less marked mental disorder and he expressed himself as agreeing with the findings of others in smaller series, namely that these patients were especially prone to ". . . apathy, indolence, decreased mental work, loss of memory, delirium, shallow confusion, stupid indifference to surroundings, to external impressions and to the disease itself; instability, shallow confusion, with impairment of ideas of time and place, abeyance of the mind, loss of inhibition, peevishness, gradual mental deterioration, varied by control, good temper, and an angelic disposition for longer or shorter intervals; somnolence, with a tendency on being aroused to exhibit a certain degree of mental confusion, particularly to surroundings, which may manifest itself in a delirium of a low quiet type, a continuance of the dream state which the patients can not shake off on being aroused, and which usually subsides spontaneously on further stimulation." With regard to the etiology and prognosis in these mental cases, the same author expressed himself as follows: "Why it is that some patients develop psychosis and others do not, is a hard question to answer. It may be that constitutional factors play the deciding part; this was very evident in some of our cases, but by no means in all . . . It is usually said that the mental disturbances proceed pari passu with the intensity of the anemia . . . but it does not invariably hold for the cases in which the more marked mental disturbances are exhibited." Thus we see that there is a process of gradual disintegration in both the spinal cord and brain of some of the sufferers from this malady.

Turning now to the gastro-intestinal side of this disease, we find the second of the new facts discovered in this period of slow ramification of knowledge. This consisted of the description in 1888 by William Hunter[35] of a peculiar form of glossitis occurring in patients suffering from Addisonian anemia. In 1903 he further ampli-

fied this, in the report[36] of 25 cases. This article he devoted to two objects: first, a defense of the original view of Addison concerning the disease; and, second, its etiology. From what we read about him, William Hunter was of a somewhat fiery disposition, very prone to take sides, and argue violently in favor of his convictions. Fully half of this article was filled with the lauding of Addison and his British contemporaries and the satirizing of the viewpoints of Biermer, Eichhorst, and especially Quincke. To us, the final touch of irony is that the especial fault that he most deeply abhorred in them, namely the assigning of a cause to Addisonian anemia, he himself committed in the second section of his paper. His opinion can be best expressed in his own words: "In all the cases observed during life, 25 in number, and in the cases, 7 in number, in which postmortem examinations were obtained, I found certain infective lesions in the mouth, tongue, stomach, or intestines—either singly or associated with each other. These were of two classes: 1, a special form of glossitis (in every case); 2, septic lesions, viz. (A) a preceding or existing 'oral sepsis' (24 cases); (B) 'septic gastritis,' the condition I described (1900) as a common result of the long continued oral sepsis, causing finally gastric atrophy (more or less in every case and most intense in 3 cases); (C) 'septic enteritis,' e.g., a croupous enteritis, patches of congestion and catarrh, follicular enlargement, and patchy colitis (3 cases). With regard to these, the point to be emphasized now in view of the significance I shall subsequently attach to them is: in no cases were these lesions either in anatomical character or severity sufficient of themselves to originate the intense anemia by any interference with nutrition they may have been capable of producing." And again under special etiology, "There are two classes of lesions which I consider of importance in this relation—1, a hemolysis of special degree and character, well shown by the analyses in the present series of seven cases; and, 2, a glossitis, observed in every case, having the peculiar relation to the onset of the anemia, and clinical character suggestive of its being of an infective nature, described by me in 1900. Histological examination in seven cases shows that it has even more striking pathological features, and in all three cases bacteriologically examined, these are associated with, and presumably dependent upon, a deep seated pure streptococcal infection of the substance of the tongue." One wishes that he had been more detailed in descriptions of this glossitis, but he evidently was describing the same phenomenon that Dr. Schneider[37] of Minneapolis had recently so beautifully shown, namely that beneath the mucosa of the reddened areas on the tongue in active cases of pernicious anemia, there can be seen and isolated pure colonies of streptococci viridans.

The percentage of pernicious anemia cases having achylia gastrica had risen steadily with our increase in knowledge of this disease. From statements made in 1890 that it was said to occur frequently, we find that in 1910 achylia occurred in over 90 per cent of the cases; while at the present time the diagnosis of Addisonian pernicious anemia can not be made without the proven absence of hydrochloric acid from the stomach.[31,39] Along with the increasing importance of this achylia, there has been developing a more and more active discussion as to its duration. At the present time it is generally conceded that it exists prior to the development of the disease, but as to how long, there are two very distinct schools. Hurst[31] in England strongly affirmed the hereditary origin of this gastric malfunction and pointed to the several pernicious anemia families that could be found in literature, and to the fact that the blood relatives of pernicious anemia patients show the absence of free hydrochloric acid from the stomach much more frequently than does the population as a whole. Faber[39] in Copenhagen was equally emphatic, however, in stating that the origin of this achylia was an infection, and he pointed out that in all these cases of achylia there could be found, by careful search of the past history of the patients, a story of an acute gastric-intestinal infection at some time in their lives. The correctness of either opinion is probably of more academic than practical importance.

Along with the increasing knowledge of the gastric secretions, there has been developed since 1880 the beginning of the chemistry of bile and hemoglobin constituents in the feces and serum. Eppinger[40] and Schneider[41] found that in Addisonian anemia the total amount of urobilin found in the feces for twenty-four hours was materially increased above that of the normal. Schneider[42] carried this work further and has attempted to show an increase of urobilin in the duodenal con-

tents. While this is the only thing discovered that is strictly new, yet it has rendered previously observed facts into mathematical terms and perhaps cast some physiological light on the descriptions of the yellow color of the blood plasma which was noticed and remarked upon by the original writers on pernicious anemia. Foremost among investigators in this field of serum chemistry had been Van den Bergh,[43] whose test for bile pigment in the blood is now known to every junior medical student. He found that in relapses of pernicious anemia there was a delayed positive reaction of the serum. This is generally interpreted as meaning that there is in the blood an increase of bile pigments, which have not been excreted by the liver, in other words a mild degree of non-obstructive or toxic jaundice. The explanation offered for the fact that the reaction takes place only with the addition of alcohol to the serum, and that the color of the pernicious anemia patients is distinctly different from that of the ordinary jaundiced ones, is that in the excretion of these blood pigments by the liver into the bile they are slightly changed in chemical structure. The same increase in the pigment matter of the serum can be shown by the icterus index. Thus the period of slow increase in knowledge is brought to a close and we have, in 1926, Addisonian anemia pictured as an idiopathic anemia characterized by remissions, a high color index, a wide variation in the size of the red blood cells, but on the whole distinctly larger cells than normal, a quantitative measurement of the yellowness of the blood serum as expressed by the Van den Bergh and the icterus index. We have it demonstrated that the majority of cases have at some time a glossitis, from which can be isolated pure cultures of streptococci, that almost if not invariably there is an absolute achlorhydria; and that there will be signs of degenerative changes in the central nervous system in the vast majority of cases.

We come now to the second period of rapid development in our knowledge of pernicious anemia. This began with the publication by Minot and Murphy[44] of a paper dealing with the therapeutic effects of a vitamin-rich diet, containing a large amount of fresh liver. Since Bramwell's description[17] of the therapeutic effect of arsenic in 1877, there had been little progress in the treatment of this disease. Transfusion had become a simpler and a safer procedure, but at best, it seemed only to hasten the spontaneous remissions, and did not seem of great value in the severest cases when they were on the down hill grade. In the ten years preceding this paper, various dyes had been tried with more or less indifferent success. Two Iowa physicians[45,46] have reported upon the favorable effect of intravenous mercurochrome; additional reports as to its value we have been unable to find, though numerous cases of other diseases in which it has been used with disastrous results abound. Ultra-violet light has had its advocates[41,49] some using it alone, others with one of the aniline dyes (eosin or gentian violet) as a sensitizer. A review of the incidence of relapse in this disease in relation to the time of the year did not give any proof of the lack of ultra-violet being a factor in the causing of the downward trend.[50,51] Some investigators, basing their hopes on the origin of the disease in gastro-intestinal infection, have tried to inhibit the growth of bacteria in this region. The simplest of the procedures with this in view was that advocated by Hurst[31] of Guy's hospital, who believed in large doses of dilute hydrochloric acid, given at least once a day on an empty stomach. In this country, prior to the liver regime, acriflavine and gentian violet were frequently given.[52] Favorable results have not been striking, to say the least.

Various surgical procedures have been tried in the treatment of this disease. Hartmann[53] and Moynihan[54] have both observed the development of an anemia corresponding to Addisonian anemia in all its characteristics following the complete removal of the stomach; the significance of this they have not attempted to interpret. On the theory that the disease is due to an increased blood destruction, splenectomy has been resorted to. Giffin and Szlapaka[55] reported a series of fifty cases in 1920. They came to the conclusion that splenectomy would bring about the beginning of a remission in nearly all cases, and that in 20 per cent it would lengthen the duration of life. Wm. Mayo[56] expressed himself as follows concerning this procedure, in 1925: "In this group [pernicious anemia] there were 62 cases and 4 deaths. Again it is difficult to estimate just how much good splenectomy has done. Immediate improvement practically always oc-

curred. Some of the patients have been in good condition and able to work for over five years. That there is a small group of atypical cases, that are as yet classified as pernicious anemia, and in which great benefit will be derived from splenectomy, there can be no doubt. Generally speaking the younger the case and the shorter the duration of the disease, the better the prognosis." Much more interesting are the results obtained by ileostomy. Dixon, Burns and Giffon[57] have reported six cases in which this procedure had been used, and have summarized the foreign literature. Two of their cases died from diseases other than pernicious anemia, two had a return of the anemia, while two remained well. They and other investigators have found that the cases that stayed free of the recurrence are those in which the terminal ileum lost its colonic type of bacteria and reverted to the normal following operation. This is certainly very interesting, though not at all conclusive, and supplies a fact upon which to base the belief that the disease is a toxic syndrome produced by bacteria in the intestines.

In connection with the theories of the toxic or bacterial origin of this disease, the experiments of Torrey and Kahn[58] should certainly be mentioned. They found that the injection of B. Welchii toxin into the tibial marrow of rabbits and monkeys gave a chronic, persistent, often fatal, anemia, characterized by a blood picture similar, at least, to that of human pernicious anemia. The intravenous injection of this same toxin was not accompanied by more than a transitory anemia.

Murphy and Minot[44] adopted a diet in 1926 which contained a high vitamin content and a large amount of liver. They felt that possibly avitaminosis had something to do with the production of the anemia, and in their choice of foods they followed very closely the suggestions of Whipple. Whipple,[59, 60, 61] who had been very much interested in the study of anemia in dogs for a period of years, observed that his animals that were kept anemic by bleeding would regenerate blood faster if they were on a diet containing a large amount of liver and kidney. On the other hand, Koesler[62] and his co-workers had been able to produce in aimals an anemia that resembled pernicious anemia in its blood features by the withholding of Vitamin A. When this element was supplied there occurred a marked period of blood regeneration. Concerning their diet as used in 1926, Minot and Murphy[44] state: "That the dietetic treatment is of more importance than hitherto generally recognized. The diet we have selected is one composed especially of foods rich in complete protein and iron, particularly liver, and containing an abundance of fruits and fresh vegetables, and relatively low in fat, ... Following the diet, all patients showed a prompt, rapid, and distinct remission of their anemia, coincident with at least a rather marked symptomatic improvement, except for pronounced disorders due to spinal cord degeneration." Since that time the medical world has devoted itself to the feeding of liver, and the watching of what has happened. It seems regretable that there has been no further follow-up of the work on ileostomy, or on the ultra-violet light treatment.

Investigation into what happens and why, in these cases, is intimately bound up with a class of red cells known as the reticulocytes. These are red cells in which the supporting stroma can be brought out by means of staining with cresyl blue. The method that we have used is the mixing of a drop of blood with a solution of this dye, then spreading the drop in the ordinary way to make a smear. After drying rapidly, this is stained with Wright's blood stain. The reticulocytes show themselves as red cells plus a network, more or less incomplete, of blue staining material. The work of Cooke[63] has proven quite conclusively, we believe, that this is an indication of immaturity, consisting probably of an increased permeability of the lipoid envelope encasing the cell. These reticulocytes are present in normal blood to the extent of about .5 per cent of the red cells. In conditions of increased blood production, they rise to 3 or 4 per cent, which is the usual figure that is obtained in Addisonian anemia prior to the beginning of liver therapy. Observers[64,68] agree, however, that within three to ten days after the beginning of adequate liver feeding, there is a rapid rise in the number of circulating reticulocytes. Only two manifestations of successful therapy can be noted before this rise: within a day or two after liver is begun, the patient begins to feel better, noticing that his languor is less,

and that his appetite is increasing. The second manifestation is even more striking. As we have said, in this disease, there is an increase of the bile pigments of the blood; just before the reticulocytes begin to rise, this rapidly drops to the normal. No one has an explanation that accounts for this phenomenon. The reticulocyte response beginning in the first week rapidly increases until the third week. The height to which the count of these cells rises seems to be quite definitely inversely proportional to the red cell count prior to the beginning of treatment.[64] Increase of the red cells and the hemoglobin value rise more slowly and do not reach their peak until a month or more after that of the reticulocytes. The color index at the same time becomes lower, which is, of course, due to the return of the normal sized red cells. The influence of liver therapy on the nervous and the gastrointestinal findings is certainly not marked. We know of only one case in which the hydrochloric acid was supposed to have returned and of only one case in which gross neurological findings have changed for the better.[70] It is to be expected that the paresthesias will improve; all authors agree on this, especially emphasizing that it may not be marked until after the blood count is well over four million. Rubert[69] is the only person who has so far recorded the disappearance of a gross neurological syndrome; and these occasionally disappeared prior to liver therapy. The junior author well remembers a case (No. 39345 University of Minnesota Hospital) that he saw while an intern, in which the patient had been seen and diagnosed as a well advanced case of posterior-lateral degeneration seven years before he was admitted to the medical service of the University of Minnesota Hospital, suffering from a high grade anemia, which was completely typical of that described by Addison. Careful neurological examination at this time, however, showed nothing more than a very mimimal disturbance in vibration sense.

The effect of liver seems to be almost specific for this one disease. Only two other conditions give a response at all comparable and they are the pernicious anemia of pregnancy, and sprue.[70] In these occasionally the reticulocytes will give a rise that is comparable to that which occurs in Addisonian anemia. In all other forms of anemia, the benefit of liver and kidney feeding is that of a non-specific; that is, any other equally iron-rich food would give an exactly similar rise in the hemoglobin values, and there is no accompanying response of the reticulocytes.

Work has been done on what it is in liver that gives this specific response, and the Eli Lilly Manufacturing Company was the first to perfect a potent extract. West,[71] of New York, who has done so much work on the problem of isolating the active constituent, believes that it is a polypeptide. The finding of an almost specific for pernicious anemia, in a substance that is certainly in the same general class of compounds as vitamins, has thrown the question of etiology of the disease again into the guessing contest. There are at the present time two opposing views. The newer view points to the therapeutic effect of liver, and indicates that we are dealing with a deficiency disease. Means and Richardson,[72] for instance, make the following statement: "It would seem fair to assume, in view of the new facts, that pernicious anemia is in some sense or other a deficiency disease, rather than an infectious, toxic, or neoplastic one . . . .; but it seems doubtful that pernicious anemia bears more than a slight resemblance to any of the other deficiencies with which we are now familiar. It is not a simple avitaminosis. Thus far it (the active principle) has not been found in plants, and unless vegetable sources are subsequently found, we are forced to conclude that some animals, at least all such as can live strictly vegetarian existences, are capable of carrying out its synthesis." And as to the significance of the pre-existing achylia, they summarize the work of Castle[73] as follows: "Working on this hypothesis [that the achylia had something to do with the genesis of the disease] he [Castle] showed that response similar to that obtained from feeding liver could be elicited in the majority of patients with pernicious anemia studied, by the feeding of skeletal muscle previously digested in a normal human stomach." Thus we have both sides recognizing the importance of the achylia, but upholders of the infectious or toxic theory have much in their favor. They quote widely the work of Macht,[74] which is perhaps best summarized in his own words: "1, Phy-

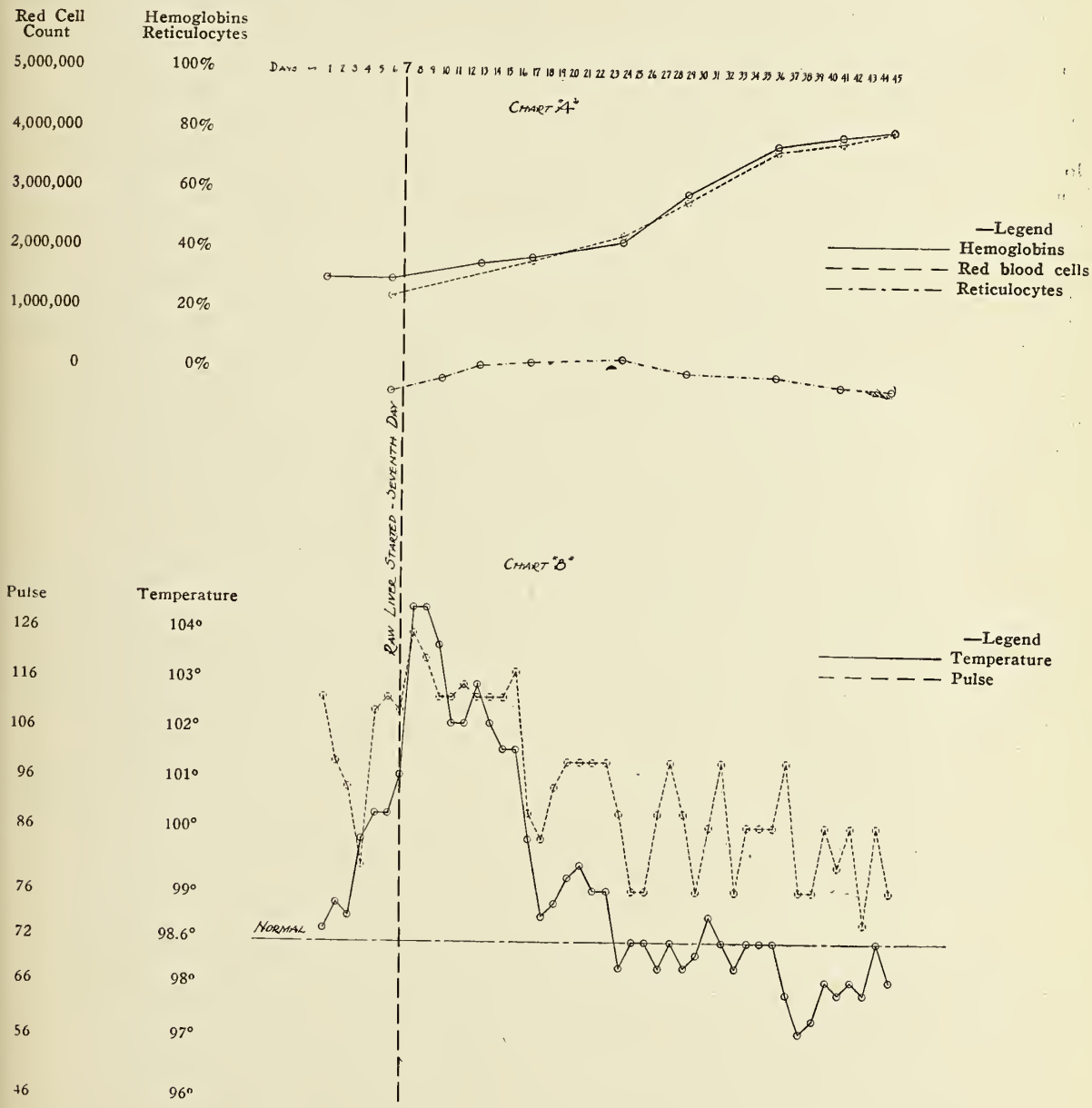
topharmacologic examination (consisting of comparing the rates of growth of seedlings in normal and anemic serum) of the blood serum from pernicious anemia shows that such serum is very toxic for plant proptoplasm, and thus suggests a toxin as the etiologic factor in this disease. 2, This phytotoxic property of pernicious anemia serum is not shown by blood serum specimens from various other blood diseases and is in this way useful in the differential diagnoses. 3, Irradiation of the pernicious anemia serum with ultra-violet rays in quartz containers renders the serum less toxic, and that effect can be increased by the addition of certain photodynamic sensitizers, e.g., eosin. 4, No treatment entirely destroys this toxicity, though both the liver and the light treatments decrease it." The fallacy in this chain of reasoning is, of course, that while it shows the presence of toxic substance, it does not differentiate whether this is the cause of the disease or one of the results of it. The most conclusive work, or at least that which it is going to be hardest to overthrow, is the work of Hunter[35] and Schneider[37] with the finding of streptococci beneath the mucosa of the tongue. The experimental work on the production of Addisonian-like forms of anemia in lower animals by means of the toxic products from various bacteria (streptococci and bacillus of Welch[75, 76]) does not seem to us conclusive. Even less well founded are the theories that the anemia is produced by bacteria in the stomach and duodenum (especial prominence has been given to the streptococcus longus[31] in this connection).

Thus, at the present time, we can say that pernicious anemia is a high grade state of anemia, characterized by abnormal findings in three of the great functional units of the body, to wit: first in the blood, where the most characteristic things are the anemia, the increase in size of the individual red cells with the consequent high color index, the replacement of the yellow marrow by red, embryonic, hemopoietic cells, and in the reticulocyte response to liver therapy. In the gastro-intestinal tract we have constantly a preexisting achylia and a peculiar form of glossitis that develops at some time during the disease. In the central nervous system we have perivascular areas of degeneration in the posterior and lateral columns of the cord, and less frequently in the brain.

TEMPERATURE CHANGES

It has long been a mootable question as to whether the presence of a severe anemia will of itself give rise to temperature. It is exceedingly hard to determine this. Practically all temperature in high grade anemia can be laid to the existence of an infection within the organism. Hence, to separate the role of infection and anemia in the causation of pyrexia is almost impossible. In primary anemia, the one anemia in which infection may not play a role, it has been long recognized that a temperature of a totally irregular type and course is characteristically present. This fact was first noticed by Biermer,[10] who differentiated it from the fevers of typhoid, typhus, and malaria by its extreme irregularity. He attempted to find an anatomical basis for it, looking especially to the occurrence of hemorrhages to coincide with the peaks of the temperature curve. In this, however, he was unsuccessful. All observers since his time have noted the temperature, and, according to their views as to the cause of this disease, the temperature was explained either on the basis of a toxemia or by analogy to the severe luetic anemias. They pointed to the temperature as a manifestation of the degree of anemia. Hunter, in the 80's and 90's, used the presence of a temperature as a strong argument in favor of the infectious origin of this disease. All authors commented on the irregularity of the fever and the fact that it may have a low or high range. All agreed also that when the patient is in extremis the temperature will fall to below normal. Cabot,[50] writing in Osler's System, commented on the fact that he had witnessed cases in which the degree and duration of fever forced the consideration of typhoid in the differential diagnosis. One cannot obtain any definite statement as to the significance of the temperature, but by reading various papers on the subject, one gathers the impression that temperature is significant in a well developed case and is not to be considered either as an early or as a late phenomenon. It is probably present largely when the patient is on the downward path. In the case reported below, the occurrence of an exceedingly high temperature was very striking. As is characteristic, the patient felt better than she had felt for days, when

her temperature was 103.8. As will be noticed from the chart, this was very shortly after the commencement of liver therapy. It is unfortunate that we did not obtain blood pigment studies, but, if we may quote Russell,[76] "The icterus index in these cases becomes normal prior to the manifested in Addisonian anemia. This occurrence of temperature would correlate with the finding of Alt,[77] who observed in five cases of this disease a positive nitrogen balance of marked degree immediately after the beginning of therapy.



rise in the reticulocytes." Thus, in our case the dropping of the icterus index from a high figure to normal would have been during this period of pyrexia. It seems to us that, while this is an unproved fact, it coincides with certain suggestions as to the nutritional and metabolic disorders

Case Report

Hospital number, 1388; female; 38; married; occupation housewife.

A housewife, aged 38, was first seen in May, 1927. At that time she complained of weakness of a month's duration. The patient appeared very pale at the time

and had a rapid heart with a hemic murmur. Hemoglobin was 50 per cent.

We next saw the patient on March 19, 1929, at which time she complained of the same tired feeling that was present two years previous. In addition she was very nervous, had a humming in the ears, and a pins and needles sensation in the feet and legs, extending as high as the knee.

Family history was unimportant. The latter of her two pregnancies was nine years ago.

Physical examination. The patient is well developed, poorly nourished, and lying quietly in bed in no apparent pain. The skin is very pale, with a slight yellowish tinge. The hair is dry; it is not gray. Eyes react to light and accommodation. No nystagmus. No coloring of the sclera. Nose and throat negative. Mouth: upper and lower plates. Tongue very smooth with two reddened areas along the edge. Neck: slight enlargement of thyroid, over which can be heard a systolic but not a diastolic bruit. Lung excursion is normal; resonance normal, and no râles. The heart is normal in position and size. Apex beat very forceful and no murmur is heard. Pulse 110. B. P. 130/80. Abdomen slightly scaphoid; no point of tenderness. Neither liver nor spleen are felt. No trophic ulcers or other abnormalities of the extremities.

Special examination: ophthalmoscopic examination shows normal disc with normal arteries and veins, the only exception being a moderate compression at some of the arterovenous crossings. There is no beating or any evidence of either old or recent hemorrhage. Neurological: cranial nerves negative. Abdominal reflexes negative. Neither the biceps, triceps, knee jerks, nor ankle jerks could be obtained. Over the entire body up to the level of the sternum there is a complete absence of vibration sense. There is little or no disturbance as to touch and none as to muscle pain. Position sense is markedly decreased in the left foot and to a lesser extent in the right.

Laboratory: urine examination upon many occasions was negative, both chemically and microscopically. Blood counts are shown in the chart. The smear shows anisocytosis, poikilocytosis, and increase in size of the red cells. White cells are essentially normal. Van den Bergh and gastric secretions were not done.

SUMMARY

1. The existence of high-grade idiopathic anemia, progressively fatal, was first described by Coombe[2] of Edinburgh in 1820. It was later redescribed by Channing[3] in 1842, Addison[4] in 1849, and Biermer[10] in 1872.

2. Pathological knowledge of the disease was complete by 1880 except for the neurological findings which were added in 1887, the glossitis in 1889.

3. Arsenic was first used by Bramwell[17] of Edinburgh in 1877.

4. The period of liver therapy was inaugurated by Minot and Murphy[44] in 1926 and has reopened the controversy as to whether the disease is essentially a metabolic disorder or the sequela of a chronic infection.

5. The occurrence of temperature has been noted since Biermer's original description of the disease. Its significance is doubtful, but its occurrence in the case reported coincided with a period in which there is a reduction to normal of the icterus index and a marked nitrogen retention.

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NEW TREATMENTS FOR CANCER

Hanson reports results closely resembling those described by Coffey and Humber, following the administration of thymus extract. Sokoloff reports similar results following the use of an extract of the suprarenal combined with iron. Charlton announces lytic effects on cancer cells following the administration of an extract of the omentum. The interest of the Coffey-Humber method, in its present stage of investigation, lies primarily in the fact that the available evidence seems to demonstrate a definite effect on cancer tissue as the result of injecting suprarenal extract into the body at points removed from the tumor. (Jour. A. M. A., March 1, 1930, p. 639.)

CAUSYTH

A number of German journals have contained more or less llaudatory reports regarding Causyth, but these are not considered to present acceptable evidence for the value of the preparation. According to the advertising, Causyth is a "cyclohexatrienpyridinsulphonacid, derived from Pyrazol, the formula being $C_{22}H_{24}N_4O_5S$." The product has not been considered by the Council on Pharmacy and Chemistry nor has the Mallinckrodt Chemical Works, which exploits it by way of its Canadian branch, "Mallinckrodt Chemical Works, Limited, of Canada," requested the Council to report on it. Apparently no reports have been published in American medical journals which are confirmatory of the German propaganda. A pharmacologist who has given much attention to the action of salicylates and other drugs used in the treatment of rheumatism reviewed seven of the eight papers which were referred to in an advertising circular. He held the evidence to be unsatisfactory and uncritical and no justification for the extravagant claims of the advertising. (Jour. A. M. A., March 1, 1930, p. 656.)

PNEUMOCOCCUS VACCINES OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that increasing experience has failed to demonstrate the value of pneumococcus vaccine in the treatment of pneumonia, and the prophylactic value of the vaccine has not been conclusively proved. The Council came to the conclusion that the experience with this vaccine has not afforded acceptable evidence for its therapeutic usefulness and voted to omit it, with the accepted brands, from New and Non-official Remedies. In accordance with this action the Council announces the omission of Pneumococcus Vaccine Immunizing (Gilliland Laboratories, Inc.); Pneumococcus Vaccine (Lederle Antitoxin Laboratories); Pneumococcus Vaccine, Prophylactic (Eli Lilly & Co.); Pneumococcus Antigen-Lilly; Pneumococcus Vaccine (National Drug Company); Pneumomoccus Vaccine (Four Types) (Parke, Davis & Co.); Pneumococcus Immunogen (Parke, Davis & Co.); Pneumococcus Vaccine (E. R. Squibb & Sons). (Jour. A. M. A., March 8, 1930, p. 716.)

SYRUP OF ALFEMINE, ET AL

Sherman L. Divis, Ph.D., is Professor of Chemistry and Director of Nutritional Research in the Indiana University School of Dentristry. He is neither a physician nor a dentist. During the past few years Professor Davis has been doing a good deal of lecturing before dental societies. In his talks Professor Davis recommends certain proprietary medicinal products, four in number: "Syrup of Alfemine," "Vicodol," "Caperoid Tablets" and "Vicaperol Capsules." All of these products used to be manufactured by the Ucoline Products Co. of Indianapolis. The manufacture and distribution of these products has been taken over by the Rochester Laboratries, Inc., Rochester, Minn. It appears that the Rochester Laboratories distribute the preparations on a royalty basis; the royalties being turned over to the trustees of Indiana University. Professor Davies does not receive any part of the royalty. Undoubtedly, the newly formed Council on Dental Therapeutics created by the American Dental Association will, in due time, investigate and report on the formulas of Professor Davis that are sold under proprietary names. Meanwhile, the entire arrangement constitutes an unusual scheme in its relationship to the practice of either scientific medicine or dentistry. (Jour. A. M. A., April 12, 1930, p. 1163.)

INCIDENCE OF BOVINE TUBERCULOSIS IN HUMANS, AND REPORT OF THE OFFICIAL CONTROL AND ELIMINATION OF BOVINE TUBERCULOSIS IN MINNESOTA*

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WHEN I received the invitation to present this paper, I replied that I did not think it proper for a veterinarian, engaged in administrative control work, to present a paper or make any statements to the medical profession relative to the types of tuberculosis in the human family. Your program committee was persistent, and I agreed to include a review of the evidence of the authorities and laboratory workers on this subject.

The State Live Stock Sanitary Board, since its origin in 1903, has extended service in the control and elimination of tuberculosis in cattle to cattle owners supplying milk to the cities and villages throughout the State, and also to any herd owners who are willing to coöperate with the Board and who would agree to slaughter their reacting or diseased cattle. The city of Minneapolis was the first city in the United States to adopt the ordinance requiring that raw milk should be derived from cattle that have passed satisfactory tuberculin tests. Minnesota was the first state in the Union to adopt the plan of accrediting herds of cattle as free from tuberculosis, and the plan adopted by Minnesota was later adopted as the cooperative plan by the Federal Bureau of Animal Industry with all the states in the Union.

In 1923 Minnesota, coöperating with the Federal Government, adopted the Area Plan for the control and elimination of the disease from cattle, by counties. This work has progressed very rapidly but we are constantly met with opposition instigated by the American Medical Liberty League, which, as you know, has large sums of money available for distribution of propaganda in order to influence legislation against every movement of modern preventive medicine. They quote statements of so-called physicians, and also extracts of articles of recognized scientists, of unproven or impractical theories. We frequently have statements circulated which are claimed to have originated from reputable physicians, quoting Doctor Robert Koch, and many of these statements claim that Koch never changed his views or modified them, up to the time of his death.

In 1901 Doctor Koch stated before the London Congress on Tuberculosis that the germs obtained from human sources were not the same as those obtained from cattle, and there was practically no danger of man contracting tuberculosis from cattle, or about as much danger to man as there was from the inheritance of the disease, which, of course, means nothing at all. He stated he did not deem it advisable to take measures against the spread of the disease from cattle to human beings. Koch's views were immediately studied by many scientific investigators throughout the world. The German Government authorized an investigation and the British Government appointed a Royal Commission. Pennsylvania, the New York City Health Department and the United States Bureau of Animal Industry also carried on investigations. The evidence disclosed by these investigators completely disproved Koch's opinion relative to the transmission of bovine tuberculosis to man and, as a result, Koch later changed his views; but he never fully accepted the results of the other investigators.

At the Sixth International Congress on Tuberculosis in Washington in 1908, when Doctor Koch was met with almost unanimous contrary opinions from other scientists, he opened the discussion on "The Relation of Bovine and Human Tuberculosis,"[1] by saying: "Human beings may be infected by the bovine tubercle bacillus, but serious diseases from this cause occur very rarely and preventive measures against tuberculosis should therefore be directed primarily against the propagation of human tubercle bacilli." He referred

*Presented before the Hennepin County Medical Society, Minneapolis, March 7, 1930.

to possible errors in the research work of others and stated that "The experiments of the British Commission failed in several respects, and all other work which has come to my notice answers these requirements so poorly that I can grant them no weight, at least as regards the occurrence of bovine tuberculosis in man." Among the speakers who contradicted Koch's opinions and defended their methods of investigation were Professor G. Sims Woodhead of Cambridge, England; Johannes Fibiger of Copenhagen; M. P. Ravanel of Madison, Wisconsin; Professor Charles W. Duval of Tulane University, New Orleans; and Doctor Charles F. Dawson of Newark, Delaware. Doctor Koch afterwards declared he had never denied that bovine tuberculosis is found in man, and tried to limit the discussion to the consideration of bovine tuberculosis in the lungs of human beings. He asked whether any cases of pulmonary tuberculosis existed in which bacilli of the bovine type of tuberculosis were found. When Professor S. Arloing of Lyons, France, Professor G. Sims Woodhead of Cambridge, England, and Professor Fibiger of Copenhagen mentioned such cases Koch again[2] questioned the accuracy of their investigations and reports, and finally concluded by saying, "I admit that bovine infection can occasionally occur, and I desire not to be understood as disregarding the endeavors to extirpate bovine tuberculosis, as far as these endeavors are dictated by agricultural and economic reasons; but I mean it would be wrong to give to these proposals the leading place in front of the efforts to combat human tuberculosis."

Koch's opinion as to the transmissibility of bovine tuberculosis to man was conclusively disproved by the final report of the British Royal Commission, presented after nine years of study and investigation.[3]

This report was practically duplicated by research men in Germany, France, Denmark and the United States, and under ordinary circumstances we would conclude that the question of the menace of bovine tuberculosis to man had been settled twenty years ago. However, a few followers of Koch have continued to support his opinions and, as a result, some laymen make exaggerated statements supporting Koch's ideas. From data, statistics and reports, a conservative estimate of the incidence of bovine tuberculosis in human beings is twenty-five per cent of the cases of tuberculosis in children and five per cent of all types of tuberculosis in man.

The World War interrupted the research work on this subject but since then the majority of the reports have come from investigations in Great Britain. Doctor A. Stanley Griffith summarized the data on this subject before the National Milk Conference in London in 1922.[4] He reported the study of types of bacillus of tuberculosis in 1,215 cases in England and Scotland; of the total number, 935 or seventy-seven per cent, were of human origin, and 280, or twenty-three per cent, were of bovine origin. He showed tables of the different types of tuberculosis in man, which disclosed that of 116 cases of tuberculosis of the cervical glands, 46.5 per cent were of the bovine type; that of 476 cases of tuberculosis of the bones and joints, in England and Wales, 18.3 per cent were of the bovine type; and of 28 cases in Scotland 28.6 per cent were of the bovine type; of 126 cases of lupus, 50.8 per cent were of the bovine type; of 52 cases of scrofulodermia, 38.4 per cent were of the bovine type; of 17 cases of tuberculosis of the genito-urinary tract, 17.6 per cent were of the bovine type; of 12 cases of tuberculosis of the meninges, 16.6 per cent were of the bovine type; of 229 cases of the lungs, 1.31 per cent were of the bovine type. He also reported an autopsy of children, of which 113 were classed as local government board series; twenty of these, or 17.7 per cent, were of the bovine type. Also, an autopsy of 46 children of the Royal Commission series, of which 19, or 41.3 per cent, were of the bovine type. Griffith concluded: "That bovine tuberculosis is an important source of human tuberculosis in Great Britain." The bovine tubercle bacillus shares in the production of all of the chief clinical varieties of human tuberculosis and causes an appreciable loss of life, especially in children. The proportion of bovine to human infections is highest in children under five years of age and in those forms of tuberculosis which are primary in the alimentary tract. The age incidence and the anatomical distribution of the primary lesions clearly point to cow's milk as the source of the infection with bovine bacilli and it ought

not therefore to be used for human consumption. Stringent measures should be taken to prevent the sale of such milk. He further states it is estimated by Cobbett, his associate, that the "bovine type of bacillus causes 6.41 per cent of the total deaths from tuberculosis of all kinds in England and Wales, or approximately 3,000 deaths every year."

The percentage of bovine infection in pulmonary tuberculosis in man (1.3) is much higher in England and Wales than in other countries, from reports which have been made.

Doctor Griffith presented a paper[5] at the Eleventh National Conference on Maternity and Infant Welfare in London on July 5, 1929, dealing with 541 cases of tuberculosis of the bones and joints. Of the patients, of all ages, 18.7 per cent disclosed the bacilli of the bovine type. Children under five years of age (102 cases) disclosed the bovine type in 30 per cent, and children under ten years of age (327 cases) disclosed the bovine type in 25 per cent.

In the official journal of the Pathological Society of Great Britain and Ireland, Griffith[6] reports the results of the work done by his colleagues on the Tuberculosis Commission, and himself, on types of tubercle bacilli and other varieties of human tuberculosis.

Table I gives the percentages of human and bovine tubercle bacilli found in the investigation of human tuberculosis:

TABLE I

ENGLISH STATISTICS

Form of Tuberculosis	Number of Cases	0-4 Years H.	0-4 Years B.	0-4 Years B%	5-14 Years H.	5-14 Years B.	5-14 Years B%	14 Years and over H.	14 Years and over B.	14 Years and over B%	Percentage Bovine All Ages
Cervical Gland	116	3	18	85.7	28	26	48.1	32	9	21.9	45.7
Bone and Joint	511	60	24	28.6	277	65	19.0	81	4	4.7	18.2
Urogenital	23	0	0	0	2	1	33.3	17	3	13.0	17.4
Meningeal	33	2	1	33.3	13	7	35.0	9	1	10.0	27.3
Autopsies	1843	72	29	29.7*	48	7	14.3†	21	1	12.5‡	22.3
Miscellaneous	23	2	1	33.3	10	1	9.1	9	0	0	8.7
SCOTCH STATISTICS											
Cervical Gland	17	1	3	75.0	3	7	70.0	1	2	66.6	70.6
Bone and Joint	30	12	6	33.3	8	2	25.0	2	0	0	26.6

*Including one of the two mixed viruses.
†Including one mixed virus.
‡Including two mixed viruses.

Griffith further stated: "The results of the bacteriological examination of post mortem material have shown that when the primary lesions are in the thorax the infection is of human origin in about 99 per cent of the cases. When, on the other hand, the primary lesions are in the mesenteric glands, only 15 per cent are 'human.'"

Some contended that tubercle bacilli are not found in the milk unless there are lesions in the udder and that only cows with such lesions should be excluded from the milk supply. The reports of the British Royal Commission,[7] Rabinowitch and Kempnes,[8] and Mohler,[8] Chief of the Federal Bureau of Animal Industry, in his review of the evidence which had been accumulated on this subject, are conclusive that the bacilli are at times present in the milk of tuberculous cows presenting no evidence whatever of diseases of the udder, even on postmortem examination.

Klein in "Principles and Practice of Milk Hygiene," states, "Anderson examined 233 samples of milk in Washington in 1906 and found tubercle bacilli in 6.72 per cent. In Philadelphia in 1908, Campbell examined 130 samples of raw milk and found tubercle bacilli in 13.8 per cent; 12 samples of milk sold as 'pasteurized' were also examined by him and one sample, or 8.3 per cent, contained virulent tubercle bacilli. Hess found tubercle bacilli in 16 per cent of the samples he examined in New York in 1909, and of 144 samples examined by Tonney of Chicago in 1910, 10.5 per cent were infected with tubercle bacilli."

When Doctor Bundeson, the Commissioner of Health of the City of Chicago, was making his fight for "Milk from healthy cattle," he obtained the services of Doctor Archibald of our Minnesota State Board of Health, to make a survey of the commercially pasteurized milk. Archibald found tubercle bacilli in 16 per cent of the samples.

Doctor L. Van Es of the University of Nebraska has been making extensive investigations for a number of years of the types of the tubercle bacilli in tuberculous material from man and the different species of animals, obtained from all parts of the United States. For the past six years he has made special investigations of the incidence of avian tuberculosis from specimens obtained from swine and cattle slaughtered at public abattoirs throughout the United States where the Federal Government maintains inspection. He has furnished me with the tentative results obtained by him prior to December 1, 1929, of the host relations of the three types of tubercle bacilli, namely, bovine, human and avian. He is not ready to publish the results of his work, but, without doubt, they will be published some time this year.

He reports the examination of 393 specimens of human lesions other than pulmonary lesions, of which 11 were of the bovine type, 217 the human type and 165 were negative. He was unable to find bacilli of the avian type in any of the 393 cases. He also reports examining and typing specimens of three cases of Hodgkin's disease of the human family, all of which were negative. He examined 164 isolated lesions obtained from the cow, most of which were lymph nodes, of which 100 disclosed the mammalian type of bacilli, 11 were of the avian type, 4 were mixed and 49 were negative; 40 cases of skin tuberculosis in the cow were all negative as he could not find any living bacilli; 5 lesions of the bovine uterus all typed negative; 58 cases of generalized tuberculosis were of the bovine type. He examined 258 isolated lesions obtained from the hog, the majority of which were lymph nodes, of which 12 were of the mammalian type, 199 avian, 14 mixed and 33 negative. One case of pulmonary tuberculosis in the sheep which was of the bovine type. Two cases of tuberculosis in the horse which were of the bovine type. Six cases in the monkey, of which 3 were of the bovine type, one of the human type and 2 were negative. Lesions obtained from two cases of tuberculosis in the fox, of which one was bovine and one negative. In chickens and pigeons 110 cases, of which 104 were the avian type, one mixed and 5 negative.

You will note that of the 393 specimens obtained from man, of lesions other than pulmonary, he was unable to disclose a single case of the avian type. He has summarized his work, tentatively, and concludes that in tuberculosis in man, other than pulmonary, the bovine type is of moderate or conditional virulence, the avian of very slight, if any, virulence, but his data are insufficient for a definite conclusion, as the typing of some of the specimens gave atypical results. In the cow the human type of tuberculosis is avirulent and the avian type is of very slight virulence and is local and non-progressive. In swine the bovine type is of full virulence, extensive and progressive; the human type of slight virulence, local and non-progressive; the avian type of moderate or conditional virulence, local and with a tendency to generalization. Tuberculosis in dogs, both the bovine and human types, are of moderate or conditional virulence and he has found no cases of the avian type in this animal.

Doctor Charles H. Mayo of Rochester,[10] in a paper presented before the American Veterinary Medical Association in August of 1928, stated that "In Minnesota from 1910 to 1925, inclusive, 34,570 persons died of tuberculosis, all but 6,343 of tuberculosis of the lungs. On five per cent of the total basis, this would mean that 108 persons died every year of bovine tuberculosis. It has been estimated that .5 per cent of the cases of tuberculosis of the lungs and 10 per cent of other forms of tuberculosis are caused by the bacillus from cattle. On this basis, 48 persons died every year of bovine tuberculosis. If we accept this lowest estimate of 48 annual deaths, in addition to the hundreds of cases of bovine infection which result in crippling and incapacitating the victims for a long period or the rest of their lives, I am sure we are justified in all our efforts to eradicate bovine tuberculosis."

One could continue to quote statistics from recognized authorities indefinitely. There is not a single recognized authority who doubts the transmission of bovine tuberculosis to man, but there still remain a few physicians who minimize the danger, even to the extent of opposing the efforts to eradicate the disease from cattle, claiming it is so slight that it is not a public health problem.

At the present time 163 cities and villages in Minnesota have milk ordinances requiring

that all cattle from which raw milk is derived for human consumption must pass satisfactory tuberculin tests approved by the State Live Stock Sanitary Board. The United States Public Health Service recommends that all cities adopt a model ordinance they have prepared, which requires that all milk shall be derived from cattle that have passed satisfactory tuberculin tests, and also be pasteurized for the purpose of eliminating the possible bovine infection and other milk-borne infections. There is no question but that all medical men engaged in the control of, or who are responsible for, communicable diseases in the human family, are agreed that milk from cattle untested for tuberculosis and not supervised as to sanitary practice, should be pasteurized.

In the European countries, except Denmark and in the British Islands, no official control measures of bovine tuberculosis have been made and, as a result, the disease has increased. The percentage of tuberculosis in cattle in the British Isles, according to authorities, is 40 per cent, and it is higher in France.

The Sanitary Authorities in Great Britain are now divided in their opinions relative to the control and elimination of the disease. Some insist that they should adopt the plan of this country and tuberculin test all cattle and slaughter the infected ones; there is another faction that condemns this procedure, claiming it would result in a milk famine and would not be economical.

Doctor Charles McNeil,[11] lecturer in diseases of children, Royal Edinburgh Hospital for Sick Children, states in the British Medical Journal of October 12, 1929: "The widespread existence of tuberculous milk constitutes the greatest and most serious example of food poisoning in this country, and gives Great Britain a 'bad eminence' in this matter over almost every other great state in the Old and New Worlds. There is no general agreed policy, either national, municipal, or private, to meet this danger. Until all of our dairy cattle are free of tubercle there are two ways of dealing with the situation, either that the public health authorities require and supervise the pasteurization of all milk supplies for young children, with the exception of certified milk, or that the medical profession unanimously recommend the boiling in the home of all milk for children."

The most ardent supporters of pasteurization are forced to admit its limitation; in practice it can be applied to only the larger cities. This leaves a large majority of the entire population without a practical means of its application. The only solution offered by the advocates of pasteurization, where it can not be practiced, is to boil the milk.

In the light of experiments in animal nutrition, and the recent experiments in the growth of children, raw milk stands supreme, pasteurized milk second and boiled milk a poor third. It is apparent from these experiments that pasteurization destroys the nutritive balance, and as the higher temperatures are applied the unbalancing is more pronounced.

Thirty-five years ago Doctor Bang of Denmark initiated a plan of control of the disease, providing for the tuberculin testing of all cattle, isolating reactors from the non-reactors on the same farm and the pasteurization of the milk and all milk products. The calves from infected mothers are immediately removed to nurse healthy mothers, or are fed on pasteurized milk. This plan has since been known as the Bang System. Owing to the high percentage of infection in Denmark at the time this system was inaugurated, the claim was made that it was the most practical and economical system to control the disease in cattle. The results as disclosed are certainly conclusive that their system is impractical for the reason that there is as high a percentage of tuberculosis in that country at the present time as there was thirty-five years ago. The reason for this, as I understand it, is the fact that it is an intensive dairy country and the farmers, to a large extent, depend upon the dairy cow for at least a part of their incomes, and they are not so financially situated that they can carry out—nor do they properly carry out—the Bang principles.

In this country thirty-five years ago we started out on the fundamental fact that we must stop the perpetuation of the bovine organism through cattle by slaughtering the reactors. This was accomplished by the tuberculin test and the condemnation of any animals revealing clinical tuberculosis. We have found that tuberculin from the time it was first

used up to the present day has been consistent in its action. This has led to the discovery of many interesting facts in connection with the behavior of the organism.

In 1918 it was the general belief that the only source of infection in the hog was the bovine organism. It was believed, if counties were tested and cattle tuberculosis eliminated, that hog tuberculosis would automatically cease. However, the result was that the condemnation of carcasses of hogs slaughtered under inspection was reduced to practically nil, while the retentions of the carcasses for tuberculosis were only slightly reduced. This was called to the attention of the research workers and it was soon discovered that the hog was not only the host of the bovine type of tubercle bacilli, but of the avian as well. In fact, retentions in hogs at government packing houses are upwards of 80 per cent avian tuberculosis. There is no extensive invasion of the avian type in hogs and no condemnation of carcasses results. Hogs infected with the bovine bacilli react only to the mammalian tuberculin and those infected with the avian type react only to the avian tuberculin. Cattle are resistent to the avian type, as laboratory experiments show that it requires a heavy inoculation of avian tuberculosis material to cause a reaction to avian tuberculin, and the period of sensitization disappears within sixty days.

Tuberculin is consistent in detecting tuberculosis. It reveals the disease before macroscopic lesions develop.

In 1918 the Federal Government, through the Bureau of Animal Industry, initiated a plan for the eradication of tuberculosis by cooperating with the Live Stock Sanitary authorities of the various states. Minnesota was the first state in the Union to sign the agreement with the Federal Government. From 1918 to 1923 this coöperative work was limited to the control and elimination of tuberculosis under the Individual Accredited Tuberculosis-Free Herd Plan, and in 1923 the Legislature passed a law providing for the control and elimination of the disease, by counties, under the Area Plan. This law provides that when fifty-one per cent of the cattle owners sign the petition the Board of County Commissioners, at their discretion, may enter into an agreement with the Sanitary Board, and further provides that the county shall make an appropriation to assist in the cost of the payment of the necessary tuberculin tests until the county is accredited. The State and Federal Government pay indemnity to the cattle owners for cattle that are condemned and slaughtered. Uniform Rules and Regulations for the elimination of tuberculosis under the Area Plan have been adopted by the Federal Bureau of Animal Industry and the Live Stock Sanitary authorities of every state in the Union. These Rules provide that if the complete test of all the cattle in the county discloses a percentage of one per cent or more, a second complete test of all the cattle shall be made a year thereafter; or if any complete test of all the cattle discloses a percentage of one per cent or more, then another complete test shall be made one year thereafter. If the test discloses a percentage of less than one per cent, the infected herds shall be retested until the percentage of infection in the entire county is reduced to .5 of 1 per cent or less, when the county will be officially designated as an accredited tuberculosis-free area for a period of three years. When any test discloses a percentage of less than one per cent, a quarantine of the infected herds is established in order to prevent the owners selling cattle to be added to herds that have passed complete negative tests. We continue to retest all herds in which infection is disclosed, each 120 days until every herd in the county has passed a complete negative test.

Our State law provides that the county's appropriation shall be used to assist in the cost of the payment of the expense of the testing until the county is accredited. After a county is accredited the state shall make all the necessary tests to eliminate the infection from the remaining infected herds, and also make the necessary retests after the three year period of accreditation has elapsed, all without expense to the county.

Of the eighty-seven counties in the State, fifty-four have taken advantage of the State law and have applied to the Sanitary Board for the control of tuberculosis under the Area Plan. Forty-three of these counties are officially accredited. We have six more counties in which at least one complete test of all the cattle has been made; five counties are on the waiting list. We have eleven counties in which the majority of the cat-

tle owners have signed petitions to the County Boards, but the County Boards have refused to recognize such petitions, apply for the test and enter into the agreement with the Sanitary Board. Some of the counties failed to take advantage of the law because of financial reasons, and we are informed that the majority of them were influenced by propaganda that is being circulated by the American Medical Liberty League. Petty politics within the Boards of County Commissioners has also been a deciding factor.

The highest percentage of infection disclosed in any county on the first complete test of all the cattle was 5.4 per cent and the lowest percentage was in Cook County, in which the cattle population was only 565; no reactors nor tuberculous cattle were disclosed.

The counties of Carlton, St. Louis, Lake and Itasca disclosed a percentage of less than .5 per cent on the first complete test. The counties of Red Lake, Marshall, Kittson, Norman, Isanti and Kanabec disclosed a percentage of less than 1 per cent and more than .5 per cent. All of the other accredited counties disclosed a percentage of one per cent or more and we were compelled to make a second complete test and also two retests of the infected herds. By so doing we were able to reduce the percentage so that the second complete test resulted in disclosing a percentage less than 1 per cent.

Time will not permit me to furnish the data of the tests of the individual counties. All of the counties in the immediate vicinity of the Twin Cities are now officially accredited; however, we have a few infected herds in each county which are under quarantine, which we will continue to retest until all of them have passed a negative test.

Hennepin County shows a fair average of the status of the counties in southern Minnesota and for this reason I am furnishing the data of all the tests in this county.

The first complete test was made in September of 1928, which test disclosed 3,753 herds containing 37,933 cattle, of which 1,434, or a percentage of 3.7 per cent, reacted to the test and were officially condemned and slaughtered. In this test we did not include accredited herds that were not due for the test.

There were 507 herds, or a percentage of 13.5 per cent, in which reacting cattle or those giving suspicious reactions were disclosed.

In December of 1928 we retested 517 infected herds containing 8,366 cattle, of which 162 or a percentage of 1.93 reacted. There were 113 herds in which reactors or animals giving suspicious reactions were disclosed.

In April of 1929 we retested 131 infected herds containing 3,016 cattle, of which 48 reacted, or 1.55 per cent. There were 21 herds in which reactors were disclosed.

In September of 1929 we made the second complete test of all the cattle in the county and tested 3,711 herds containing 40,752 cattle, of which 146 reacted, or a percentage of 0.35 per cent, and the county was officially accredited for a period of three years. There were 121 herds in which reactors were disclosed.

In December of 1929 the infected herds were retested and the cattle in all but 22 herds passed a satisfactory test. The remaining 22 herds will be retested in April and all infected herds will be subjected to a retest each 120 days until they have passed satisfactory tests.

We have nine counties in the State whose three year period of accreditation has elapsed and in which we have made a complete test of all the cattle. In four of these counties the percentage of infection disclosed on the test after the three year period of accreditation elapsed was less than .5 per cent and in five of them it was under the 1 per cent. We therefore officially reaccredited the four counties after the complete test was made and the other five counties after making a retest of the few infected herds.

Table II shows the percentage of infection in the nine reaccredited counties on the initial test for the first accreditation and the percentage disclosed three years after they were accredited:

TABLE II

	Percentage Initial Test for Accreditation	Percentage Reaccreditation Test
Freeborn	5.40	0.29
McLeod	4.94	0.24
Scott	2.61	0.32
Traverse	3.44	0.46
Wilkin	3.59	0.55
Faribault	3.11	0.98
Meeker	3.58	0.78
Murray	4.31	0.68
Red Lake	0.988	0.65

The percentage of infection after the three years did not have any connection with the ex-

tent of the disease disclosed on the first test of all the cattle in the county, but on the location of the county and the observance of the quarantine provision relative to importation of cattle. The last five counties were surrounded by non-tested counties.

The result of the retest of the cattle in these nine accredited counties is certainly conclusive and shows that the work is practical, permanent, and the public expense justified. To my mind, it is also a complete answer to all the propaganda and the false statements that are being circulated throughout the State and the country condemning the work. Without doubt, since we have succeeded in building up larger accredited areas, the danger of the infection being reintroduced into these accredited areas will be practically nil and will certainly reduce the incidence of tuberculosis in the human family in these areas.

Every state adjacent to Minnesota, and in fact throughout the United States, is coöperating with the Federal Government in eradicating bovine tuberculosis under the Area Plan of Control.

The counties in Minnesota that are accredited and those in the process of accreditation represent the territory in which sixty-one per cent of the cattle population of the State exists and also the territory in which the highest percentage of tuberculosis was known to exist. We are well over the top and the future expense for the eradication of tuberculosis from all the cattle in Minnesota will continue to be less each year. Any funds expended in the control of the disease after the State is accredited will simply be good sound insurance.

The States of North Carolina and Maine are officially accredited. Indiana and Michigan expect to be accredited within the next few months. The cattle in all but one of the counties in Wisconsin have been tested at least once under the Area Plan. The States of Iowa, Illinois and Indiana have recently passed legislation making the test of all the cattle throughout the State compulsory under the Area Plan of eradication.

During the fiscal year terminating June 30, 1928, we tested over 1,400,000 cattle in the State of Minnesota. During the fiscal year terminating June 30, 1929, we tested 1,325,629 cattle. Of this number 1,139,845 were tested in our official coöperative work with the Federal Government. The remainder were tested by practicing veterinarians under the supervision of the State Live Stock Sanitary Board. These figures do not represent the number of individual cattle tested as we retest all cattle in herds in which reactors are disclosed, each 120 days. Therefore, this total number includes cattle that have been subjected to one or more tests during the year.

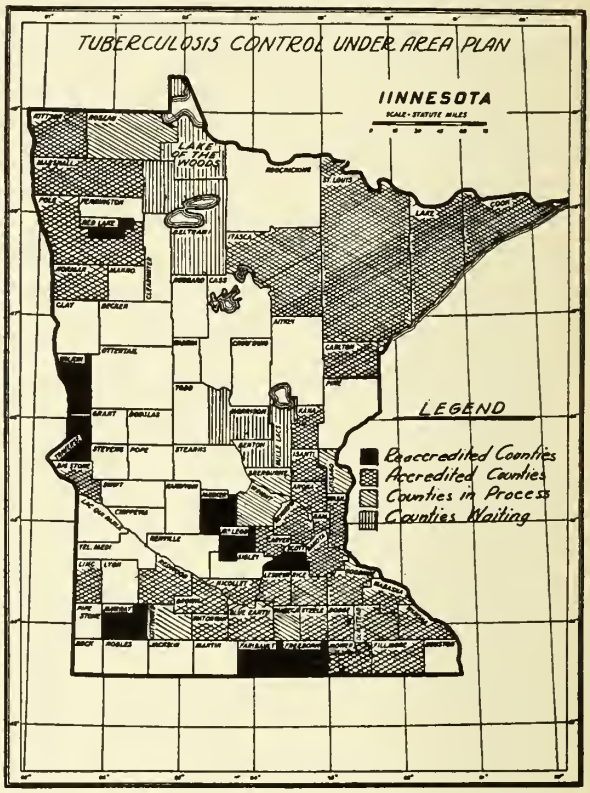


Table III shows the counties that are accredited, the counties that have been reaccredited after the first three year period of accreditation has elapsed, the counties that are in the process of accreditation and in which at least one complete test has been made, and the counties in which the Boards of County Commissioners have furnished agreements to the Live Stock Sanitary Board and which are on our waiting list to be tested.

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ACTION OF PHENOLPHTHALEIN

One should always think of the possibility of a phenolphthalein eruption when studying the etiology of a puzzling exanthem. As phenolphthalein is chiefly excreted into the intestine by means of the bile, and reabsorbed from the colon, there is a tendency for its action to continue for several days. Hence, its continued daily use may lead to ultimate overaction with diarrhea, abdominal pains, tenesmus and bleeding. (Jour. A. M. A., April 12, 1930, p. 1165.)

VAN ARD SANATORIUM

The Van Ard Sanatorium, Inc., does a quack rheumatism-cure business from an old brick residence on the South Side of Chicago. It is an Illinois corporation with an authorized capital of $10,000. Its officers are listed as J. B. Creevy, President; H. L. Cassel, Secretary. They are the same individuals who are, or were, connected with the "Cass Treatment for Rheumatism." The impression is given in the Van Ard advertising that Charles J. Cahill, who is connected with the business of the firm, has special knowledge of the treatment of rheumatism. Needless to say, Cahill's name is unknown to scientific medicine. Just as in the Cass Laboratories fake the letters were signed "Harvey L. Cass" (a person who didn't exist), so in the Van Ard Sanatorium quackery most of the letters are signed "J. B. Crenon, Secretary." And just as "Harvey L. Cass" was really Harvey L. Cassel, so, doubtless, "J. B. Crenon" is Joseph B. Creevy! Reports were received from California of three deaths in which the principal autopsy finding was an extreme degree of atrophy of the liver. The reports brought out that two of the women had been taking the Van Ard "treatment," while the third had been taking the Cass "treatment." From the results of chemical analyses carried out in the A. M. A. Chemical Laboratory it may be stated that the Van Ard treatment consists essentially of acetylsalicylic acid (aspirin), cinchophen, sodium bicarbonate (baking soda) and a laxative. It is obvious that the Van Ard and Cass "treatments" are for all practical purposes identical. In the Cass treatment it was epsom salt, flavored, while in the Van Ard treatment it seems to be phenolphthalein and aloes. (Jour. A. M. A., April 19, 1930, p. 1255.)

"S. C. A." SOLUBLE ANTIGEN, "S. C. A." SERUM EQUINE (CONCENTRATED), AND "S. C. A." SERUM BOVINE (UNCONCENTRATED).

The Council on Pharmacy and Chemistry issues a preliminary report reviewing the available evidence published by J. C. Small concerning preparations stated to represent products obtained from the bacterium claimed to be the cause of rheumatic fever. Preparations of this organism were presented to the Council by the H. K. Mulford Co. as S. C. A. Soluble Antigen, S. C. A. Serum Equine (Concentrated) and S. C. A. Serum Bovine (Unconcenrated). The Council decided that the published work of Small does not offer sufficient evidence to warrant the acceptance of the Mulford products. Further doubt has been cast on the value of this therapy by the paper of Dr. May G. Wilson, in which it is reported that the administration of *Streptococcus cardioarthritidis* antiserum and of the soluble antigen of *Streptococcus cardioarthritidis* did not seem to influence the usual clinical course of the disease or prevent the occurrence of relapses. The Council holds that, while the products are suitable for controlled clinical investigation by experimental workers, propaganda which invites their general use is not warranted at this time. (Jour. A. M. A., April 26, 1930, p. 1303.)

ANTIUSTIO NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Antiustio is claimed by the manufacturer, Frederick Laboratory, Toledo, Ohio, to be "The Greatest Burn Remedy in Existence." A circular contains the following indefinite and non-quantitative statement of composition: "FORMULA Solvent Solution of Plumbic MATERIALS Subnitrate of Bismuth Zinc Sulphate and Iodide of Lead combined with mineral waxes." From this and other statements it would appear that Antiustio is a petrolatum-paraffin mixture claimed to contain 5 per cent of bismuth subnitrate along with small but undeclared amounts of zinc sulphate and lead iodide. The Council found Antiustio unacceptable for New and Non-official Remedies because it is an unscientific preparation marketed with an inadequate statement of composition, under a name which is not descriptive of its composition and with claims that are exaggerated and unwarranted. (Jour. A. M. A., November 16, 1929, p. 1559.)

THE PRE-OPERATIVE CARE OF PATIENTS FOR PROSTATECTOMY*

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IN any field of surgery it is our obvious duty to hold the mortality to the lowest possible point. The great discrepancy of the mortality rates in different institutions evidences the fact that in dealing with the enlarged, obstructing prostate some factor besides the surgical technic, *per se,* must be considered as the cause. It has been shown in many clinics that an exact understanding of the abnormal physiology present in these patients and the application of steps to return their functions to as nearly normal as possible, before any operative intervention takes place, will usually lower the mortality to as low as 2 to 5 per cent. In other institutions the mortality is still 25 to 30 per cent because the significance of careful preparation is not understood or, if understood, is not practiced.

In prostatic surgery we are usually dealing with poor primary risks, old men with lowered vitality, 80 per cent with cardiovascular pathology, 50 per cent with pulmonary disease and few with a normal renal function.

Benign hypertrophy of the prostate with obstruction is not unlike any other obstruction, whether it be biliary, gastric or intestinal, with its resultant toxemia. This may be an increased retention of nitrogenous products due either to the breakdown of body protein or a failure of excretion, or other alterations of normal balance in blood constituents, fluid balance, chlorides, carbon dioxide combining power or acid base equilibrium.

After taking a careful history, a complete and thorough physical examination should be made in search of coincidental diseases and, if found, these should be treated appropriately. The urological examination is important and should include an especially careful search for evidence of infection of the kidneys, bladder, prostate, seminal vesicles and epididymes. The immediate laboratory examinations to be made should include blood Wassermann, coagulation time and typing, as well as the usual routine examination. A careful search of the urine should be made for evidences of infection, and if present these should be localized. Blood chemistry should be estimated every three or four days throughout the preliminary management, as it gives direct evidence of the progress the patient is making and aids in determining when the maximum kidney function is reached. Urea nitrogen and creatinin content are the most important, but blood sugar determination should also be made, as by so doing one will occasionally avoid the embarrassment of operating upon a patient in the hyperglycemic state.

If the bladder is palpated or shown by percussion to be above the symphysis pubis, care should be taken not to empty it too rapidly, as these cases with high grade retention frequently develop a suppression of urine if the back pressure is too suddenly released. Decompression may be done by intermittent catheterization, replacing about two-thirds of the amount of urine removed with boric acid or some other antiseptic solution. I feel that frequent catheterization more commonly leads to infections than does a correctly managed inlying catheter. Shaw and Young have devised a very ingenious decompression apparatus, which can be used by the patient in bed or in a wheel chair, and this aids greatly in keeping these patients exercising and thus does not alter the normal habits to any great degree. A decompression can, however, be done very satisfactorily without this apparatus and I feel it should be done in every case that shows a residual above 150 c.c. The following is a satisfactory method: After having the patient void, an inlying catheter is inserted, taking care not to allow the residual urine to escape. The catheter is then attached to a tube leading to a receptacle on a standard at the side of the bed. The end of the tube is raised to the point at which the bladder pressure raises the urine and the level marked, allowing all the

*Read before the St. Louis County Medical Society, Duluth, Minn.

urine which is excreted to flow at this level for the first twenty-four hours. The container is then lowered 5 cm. daily until it reaches a level about 15 cm. above the bladder, after which it may be allowed to drain freely. In cases of more or less acute retention in which the blood chemistry does not show much evidence of kidney damage the drainage level may after a few days be lowered much more rapidly than that stated, though this should not be done in the presence of hypertension or much increase in urea nitrogen or creatinin.

After decompression is completed, a phenolsulphonephthalein functional test should be made and repeated twice weekly in order to watch the progress of recovery of the kidneys. Intravenous administration of the dye is preferable to the intramuscular route because of the fewer sources of error. Employing the intravenous route we are assured that the dye comes into direct contact with the convoluted tubules immediately and there is practically no error in determination of appearance time, which is one of the important parts of this function test.

To avoid complicating infections the daily instillation of various antiseptics into the bladder has given excellent results. Among those commonly used are mercurochrome, silver nitrate, argyrol, oxycyanide of mercury and meroxyl. Of these, meroxyl probably has the most advantages. In strength of 1 to 400 or 500 it is only slightly irritating, actively germicidal and does not have the disadvantage of masking gross blood, or being precipitated by urine, serum, pus, or blood. One ounce of 1 to 400 solution instilled and retained in the bladder for a short time twice daily will not only prevent infection but will aid greatly in clearing up any cystitis which may be present.

Preliminary vasectomy or vasoligation has increased in practice recently and is now being done routinely in numerous clinics. Reports from various clinics show an occurrence of epididymitis in prostatectomy patients varying in frequency from 20 to 80 per cent with a probable average of about 35 per cent. Besides being a painful complication for the patient and a disagreeable one for the surgeon it is also quite an economic complication to the patient. Vasectomy should be done as soon as preparation for the operation is started, preferably before any instrumentation. It is such a minor procedure that it may be done in bed while decompression is going on and without disturbing the patient to any great extent. Rolnick in his experimental work showed that unless at least 1 cm. of the vas is resected there will again be union and unless the sheath surrounding the vas is excised there is considerable danger of epididymitis due to the infection traveling along the lymphatics. Vasoligation does not completely fulfill the above requirements and therefore is not so desirable as a correctly performed vasectomy.

Preliminary cystostomy is necessary in about 25 per cent of the cases. The factors demanding this procedure are: intolerance to the inlying catheter, intercurrent urological infections, psychoses and inability to catheterize the patient. It may also be the method of choice in cases which require prolonged drainage.

The judicious use of fluids, combined with preliminary drainage is without doubt the most important factor in carrying a large percentage of patients through a successful operation. Fluids in sufficiently generous amounts are detoxicating and diuretic, thereby neutralizing and eliminating toxic products, as well as maintaining the normal viscosity of the blood. As soon as drainage is instituted fluids should be forced up to at least 4,000 c.c. daily, and when a uremic or preuremic state exists at may be necessary to give as high as 10,000 to 12,000 c.c. in twenty-four hours. Water may be given in large quantities by mouth but there should be no hesitancy in utilizing the other available routes, *i. e.*, by vein, rectum or hypodermoclysis. The use of 1 per cent sodium chloride solution intravenously, as recommended by Bumpus, is efficient in overcoming the impaired renal function in these patients. It not only increases the blood and tissue fluids but also restores the plasma chlorides to normal. Glucose solutions are advantageous for heat and energy as well as being efficacious in stabilizing the disturbed acid-base equilibrium. It may be given by mouth or rectum but is probably most beneficial when given intravenously in 5 to 10 per cent solutions, whether alone or in combination with 1 per cent saline solution. The chief contraindication to forced fluids is a weakened myocardium and cases so

afflicted should be carefully watched for the first evidence of edema in order that a happy medium may be reached—one beneficial to the kidney without damage to a weakened heart.

By the judicious use of digitalis in valvular and myocardial disease as well as in those with arrythmias, one may, without embarrassment, through its action of increasing the cardiac reserve, eventually get the fluid intake up to 4,000 to 5,000 c.c. daily. Patients with hypertension are also benefited by the use of digitalis and usually go through the operation with less shock than when not digitalized.

It is unwise to operate upon this type of patient too early or before all of the above mentioned preparatory steps are completed. At least ten days of observation, testing and preparation should be made even on men who are apparently in excellent condition. In markedly advanced stages it may require several months of drainage before the functional tests have reached a normal stability and the patient's system is ready to cope with the shock, infections and hemorrhage which may accompany or follow a prostatectomy.

General anesthesia is rarely used today in prostatic surgery. It has been supplanted by the use of novocaine to such an extent that but a small percentage of the prostatectomies are being done with the more dangerous anesthetic. Sacral or epidural anesthesia is satisfactory in 80 to 90 per cent of these cases when combined with adequate infiltration or infiltration block of the abdominal wall. If anesthesia is not complete it can be supplemented most satisfactorily by direct infiltration of the capsule under direct vision.

Spinal anesthesia has much to recommend it in selected cases. Ephedrin has done much to overcome its depressant effect sometimes characterized by an alarming drop in blood pressure. This condition is especially dangerous because it may result in a delayed suppression and consequent uremia.

Neither spinal nor sacral anesthesia has the deleterious effect of general anesthesia upon the pulmonary and cardiovascular systems, which it has been our endeavor to protect throughout the preparation.

In conclusion it may be said that, by careful examination, intelligent understanding of the physiological principles involved, the use of the facilities at our disposal with which to regain a normal physiologic equilibrium, delay rather than haste in operating, and finally, the choice of a safe anesthetic, prostatic surgery will enjoy the position of relative safety it deserves.

410 Fidelity Bldg.

UNDULANT FEVER BACTERIAL VACCINE

The Council on Pharmacy and Chemistry reports that the Jensen-Salsbery Laboratories, Inc., have presented Undulant Fever Bacterial Vaccine (Jensen-Salsbery) for consideration by the Council. This product is stated to be a physiologic saline suspension of *Brucella melitensis* (var. *abortus* 75 per cent, and *suis* 25 per cent). From an examination of the published reports the Council's referee came to the conclusion that this material does not offer adequate evidence for the usefulness of the product and that this form of treatment should be subjected to further controlled clinical trial. The Council voted to publish its preliminary report and to postpone definite action on the question of accepting Undulant Fever Bacterial Vaccine (Jensen-Salsberg) while awaiting the development of further evidence of its therapeutic value. (Jour. A. M. A., April 26, 1930, p. 1304.)

SUN CHOLERA MIXTURE

During the cholera excitement in New York in June, 1849, a physician by the name of G. W. Busteed sent a recipe for the disease to the editor of the New York *Sun*. It was printed, and was so successful in the relief, at least, of the symptoms that it came to be popularly known as the Sun Cholera Mixture. It was admitted to the first edition of the National Formulary in 1883 and in subsequent editions under that name. The original formula called for: tincture of opium, tincture of rhubarb, tincture of capsicum, spirit of camphor, essence of peppermint, equal parts. The formula was modified somewhat later on account of the changing strength of some of the ingredients in later editions of the Pharmacopeia. (Jour. A. M. A., April 5, 1930, p. 1088.)

TRACHOMA PROBLEMS AS DEALT WITH AT THE THIRTEENTH INTERNATIONAL CONGRESS OF OPHTHALMOLOGY*

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Minneapolis

IN view of the notable presence of trachoma among our Minnesota Indians, the subject of trachoma presents uncommon interest to the medical profession and the general public of the state of Minnesota.

The hygienic and social significance of trachoma was accentuated by the attention given it at the last International Congress of Ophthalmology, held at Amsterdam and the Hague, during its session in September, 1929.

The discussion took the form of a symposium, and was participated in by many of the leading ophthalmologists throughout the world, including Wibaut of Amsterdam, Vefik Bey of Turkey, Nouri Hefmi also of Turkey, Riza Sadi of Syria, Hindawy of Arabia, Chams of Persia, Ticho of Palestine, Miyashita of Japan, Soira of Spain, Da Gama Pinto of Portugal, Petit and Magito of France, Selenkowsky of Russia, Grosz of Hungary, Hanke of Austria, Bakker of Holland, Wright of England, Ferguson of New Zealand, Fallen of Luxembourg, Gronhelm of Sweden, Maggiori of Italy, and Brukner of Czecho-Slovakia, and others. The writer listened to many of these addresses and their discussion, and from these, and the printed material obtained at Amsterdam, he will, to the best of his ability, indicate their general trend and significance. This, however, is not easy, for the subject was dealt with to such an extent, and the different phases presented were so numerous, that to present in synoptic form for a short paper is no easy task.

The subject was presented largely from the following viewpoints: (1) the geographic distribution of trachoma and its frequency in these areas; (2) the different methods carried out to obtain statistics regarding trachoma in the different countries; (3) methods to segregate and to prevent extension. Other phases were brought up and discussed, but those just enumerated constituted the framework for the symposium. Very little regarding treatment was said, and this little, simply restated, present well known and usual practices in the treatment of the disease. These largely concerned questions of prevention of infection, usual local medication, and expression. I did not hear removal of the tarsus recognized as a desirable procedure, and, in fact, several times noticed that this method of treatment was disapproved.

So expansive was the material presented that it will be necessary for me to briefly consider these somewhat in orderly arrangement, and to do this, we will proceed in the following manner:

(A) Methods of obtaining statistics. These were as follows:

1. Official statistics based on compulsory notification.
2. Examination of school children.
3. Examination of recruits.
4. Examination of samples of population more or less representative.
5. The number of trachoma patients in proportion to other eye diseases in ophthalmic clinics.
6. The absolute number of trachoma patients known to oculists or general practitioners.
7. Approximations given by oculists or general practitioners who know the country.
8. Trachoma percentage in the causes of blindness.

We may briefly remark upon these, through the assistance of the World Trachoma Map, as presented by Wibaut of Amsterdam. Regarding the first (compulsory notification), the figures obtained are always much too small. In Syria, the official index is but 3 to 5 in 10,000, whereas, in fact, 59 per cent of all the eye cases occurring in Syria are trachoma. In certain parts of Russia, an index of 534 to 10,000 is given, whereas, the real and correct index is 45 per cent of all eye cases. It is to be noted, however, that through compulsory notification we may discover some

*Read by request before the Minnesota Academy of Ophthalmology and Oto-Laryngology, in January, 1930.
This review of an important symposium and discussion on trachoma was made from notes taken at the time of and literature given out during a visit to Amsterdam in September 1929, when, by invitation, an address was also delivered before the Congress.

relative value for different parts of the same country, or different countries.

As regards the examination of school children, we obtain a very exact series of figures, especially when the school population is not a select one, and the diagnosis is made by an experienced oculist. In some countries, however, this percentage may be much too high where there is a frequent occurrence of follicular conjunctivitis, which may not be, or cannot be, distinguished from trachoma.

As regards recruits, statistics are of distinct value when obtained from a country where conscription exists.

As regards four, the examination of samples of population more or less representative, the figures are generally too high, for there is an inclination on the part of the oculist to seek for cases of trachoma if the disease is not very prevalent. Furthermore, the population may either come when they have eye diseases, or may try to evade examination.

As regards five (the number of trachoma patients in proportion to other eye disease in ophthalmic clinics), this is the oldest method of approximation and the one most used by former writers.

The figures obtained by taking the absolute number of trachoma patients known to oculists will be found much too small, since a large number of such patients are never treated, and when the diagnosis is made by general practitioners, many cases are overlooked.

Attention was called to the fact of the diagnostic difficulties presented. A large number of cases resembling trachoma are not necessarily trachoma, and there is much confusion with follicular forms of disease. It is not easy to estimate the influence of race, but as a rule it was thought that the race differences go hand in hand with the differences of social welfare and education. No race seems to be immune, not even the negro, although this has been disputed. There is undoubtedly a predominance of trachoma in the female. Some reports stress the importance played by the general constitutional condition; and general welfare is a factor that is obvious and generally admitted.

As to the causes of the spreading of trachoma, we may state that the contagiousness of the disease is now generally admitted. This has been proven too often to deny. On the other hand, the degree of this contagiousness differs enormously. Cicatricial and chronic granular cases may be only slightly contagious, while the acute cases may be extremely so. As regards the onset, it has been found, in some deliberate self-infections and in some other known cases, to be about from four to ten days, but as regards the incubation period of the more chronic beginning cases, nothing definite is known. As regards the mode of infection, little is known. By direct observation in many countries, it has been proved that it often takes place in the family.

Miyoshita (Japan) shows quite conclusively that not only are infants often infected but that the trachoma percentage in the schools is at its maximum at seven years of age, proving that most school children must have become infected at an early age at home. The rôle of the mother as the source of infection is not so prevalent as has been contended. Sobhey Bey informs us that in Egypt nearly all trachoma school children take the disease into the school with them, and in Italy Maggiori states that measures are taken to isolate and treat the children before they are of school age. Selenkowsky in Russia, others in Palestine, as well as ophthalmologists in the Baltic countries, state that their experiences were practically the same; that the children were infected before they came to school, and that the younger children are infected mostly by their brothers and sisters. On the other hand it is interesting to note that while very few emphasize the significance of school infection, yet it is a thing we cannot deny, but the rôle played by the school in spreading the disease is not so great as was formerly believed.

As concerns the mode of contamination, this is generally by direct contact, and this danger may be increased through workmen, or others, who enter from countries in which there is much trachoma. Toilet articles in common use may be conductors of the infection, but it was not thought likely that dry objects, such as tools, had much to do with the spread of the infection. In many southern and eastern countries, especially Egypt, it has been a popular conception that flies may carry the disease, but the view was expressed that while this seemed to be true as regards the secondary infections, and not proved as regards trachoma itself, it cannot be denied, especially as concerns the acute cases. As regards the secondary infections, endemics are pos-

sible without them, as has been proven in the Baltic countries and in Russia. It appears that the dryness of a climate, although not a principal factor, plays its part in the spreading of the disease. Traffic has also a rôle, as shown in the increase of the disease at Marseilles, and the general increase during the World War; and the number of cases noticed at crosspoints of traffic in Africa. It was pointed out, however, that the most rigid immigration control will never completely eradicate the disease in a country where it is endemic. Neither would it have much result between two countries which are affected. It has, of course, value for those countries which are little infected. The decrease of trachoma, in high altitudes, may be particularly, or entirely, due to the fact that in these regions there is much less traffic.

As regards the eliminating of trachoma and its prophylaxis, while the situation was regarded as a terrible one, the view was expressed that there is no reason for too pessimistic an outlook. Even between Egypt and Palestine, the most infected countries, the fight against this disease does not seem to have much effect.

We next come to the consideration of measures advocated for the control and eradication of the disease. The control of national frontiers may of course be of great value from the international standpoint, but is only of personal value when it induces the sufferer to submit to treatment. Legal measures demanding compulsory notification have value, if carried out, for the prophylaxis is only of direct use when this leads to treatment. On the other hand, when the fear of notification stops the sufferer from consulting an oculist, it does more harm than good.

As stated, it has become a well-established fact that trachoma patients are, as a rule, already infected in childhood, and it is also pointed out that treatment in the early stages of this disease brings about the best results. Thus, the examination and proper treatment of school children appears to be the best method to combat and prevent the disease. It was pointed out that exclusion from school and segregation in schools and special classes without treatment have not proved efficient measures, in view of the great influences of family as regards the spreading of the disease. The examination and treatment of recruits has also been effective, but here also results are better if the treatment is started at an earlier age. It is unanimously agreed that in the infected countries there is a dire need for more physicians, more oculists, and more hospitals. General hygienic measures, as cleanliness and good housing, are important, but these are only too often beyond the power of the oculist to influence, and the same may also be said regarding the betterment of general welfare. Scientific investigation is important, especially as concerns the micro-biological etiology of trachoma and the diagnosis of incipient forms, and the relation of trachoma to certain forms of conjunctival folliculosis.

The importance of international collaboration was recognized and thought to be absolutely necessary. Every country in which the disease is prevalent and endemic is a source of danger to its neighbors. Frontier controls interfere with communication, and give only relative results. For this reason it is clear that countries free from trachoma should interest themselves in the fight against this terrible disease ravaging their affected neighbors. In this way they may remain free from infection themselves, while at the same time helping those who are suffering. That most of the countries affected are also the poorest, is an outstanding reason in itself for international intervention and help.

To accentuate the terrible grip of trachoma upon the human race, I shall give a few figures strikingly illustrating this. Almost every aspect from which we view the subject of trachoma is important, and that related to its wide distribution is not alone interesting but severely alarming. Except in some sporadic instances, we are not, in our country (America), confronted with the disease to such a degree as to give us a true measure as to the frightful and serious menace it is to the world as a whole. To give some idea of these startling aspects, we will turn to the extensive reports presented at the International Congress. These will show you that the problem is not only a very serious one but one that is truly international. It is important for those nations afflicted to improve the conditions, but it is also quite as important for other nations less affected to have the disease stamped out in the affected areas as a matter of self-protection. It is thought that the number of trachoma patients in proportion to other eye disease in ophthalmic clinics presents a fairly reasonable index as to the amount of the disease in that country

or community. Thus indicating the number of eye cases by the numerator (b) and the population index by the denominator (a), we have a frequency index of b/a. On this basis we find that in the countries in which trachoma is more frequent the disease is found in about one-third of the population, ranging from 4 to 5 per cent, to as high as 80 per cent. In Finland, in 1900, using this index somewhat modified so that the population index is (a) and one-third of the index of trachoma among eye cases is (b), we find there was 15 per cent. In 1928 this had diminished to 4 per cent. The conditions elsewhere are strikingly different. At present, in the Baltic provinces, we find in Esthonia 10 per cent, Lavonia 15 per cent, and in Lithuania 22 per cent. In Cochin China, it is 38 per cent, and in Palestine 16 per cent. In Syria we have the startling index of 80 per cent and almost as great in Lebanon of 76 per cent. In the Argentine we have 41 per cent, in Japan 28 per cent, in Formosa 40 per cent, and in Corea 16 per cent. Surely, these figures are sufficiently alarming to cause us to grasp the world significance of this disease. A general survey presented to the Congress, showed that in Italy the recruits had trachoma in 8.84 per cent, with a maximum in those from Sardinia of 56 per cent. The school statistics showed that this disease is greatly spread among the school children, from 10 to 12 per cent in some places. In some areas a marked diminution has occurred under the influences of measures taken for combating the disease. The disease is more frequent in the great industrial centers and at the large ports; and the immigrants entering play a large part in spreading the disease. The nature of industry is of secondary importance, and there are 80,000 sufferers from trachoma under supervision in Italy. In Tripoli, there is about 25 to 80 per cent of the population affected with this disease. In contrast to this, in Belgium there has been a gradual decrease, so that there is now but from 0.5 to 1 per cent of persons examined who show trachoma. In Rumania, the reports of Malonesco and Panikscu, and others, showed a great increase in trachoma since the war, especially in Transylvania. In the clinic at Bucharest the eye patients treated for this disease have increased from 10 to 20 per cent. The disease is more frequent along the Ukranian frontier and the total number of trachoma cases in Rumania is estimated at about 90,000, of which only 11,000 are under medical treatment. Maiewsky reported that in Poland, in some localities, all of the school children are trachomatous, especially among the Jewish population, and the war did much to spread the disease. Examinations in Warsaw give figures of between 10 per cent and 100 per cent. In Czecho-Slovakia, Bruckner reported that out of 13,000,000 population, 61,000 suffer from this disease.

However, these reports, alarming as they are, do not so deeply impress us as the report of Prof. Selenkowsky of Leningrad, as well as those from Palestine by Ticho; the latter we will consider first. In Palestine there are about 400,000 trachoma patients, 15 per cent of the Jewish population, and 50 per cent among the Arabian. The frequency rapidly increases from the third to the fifth year of life, but remains stationary until the eighth year, and then gradually decreases to the twentieth. Ticho states that the children are already infected before they come to school, and that infection in the school is rare. More boys than girls are affected in the proportion of 4 to 3. More children from the country are affected, than from the towns. In explanation of this apparent paradox, probably the explanation is found in that in the small towns of the country health supervision and the general surroundings are not so good as in the larger towns with more official administration. He states that the temperature has an indirect influence by furthering acute purulent conjunctivitis in the hot months. In 26 per cent of the blind in Palestine the cause is found in trachoma. We will now briefly consider the report of Selenkowsky. Russia is an incomprehensible territory with different geographical features, different populations, with different cultures and methods of living. In European Russia, with a population of 113,000,000, there are known 767,306 cases of trachoma, or 144 for every thousand of the population. In Asiatic Russia, of a population of 11,000,000, there are 124,062 of the population affected, or 90 for every thousand; in the Caucasus 58 in every thousand; in Siberia 45 in every thousand. The industrial circles are affected less, and the borderlands and cities are affected more. Selenkowsky believes that it is not probable that an immunity is present in the adult, and also that there is not a special susceptibility in the child's conjunctiva. The disease does not seem to be racial in its manifestations, but rather it is to be found that the extension is

largely concerned with the immediate or indirect surroundings of individuals. It does not appear as much in favorable localities as in villages situated near swamps and those that have few trees or forests. In final analysis, it seems that the disease is one intimately related to living conditions, both in its origin and its extension. In the upper classes of society—the more cultured—there is comparatively little of this disease, but in the lower classes, living under most unfavorable hygienic conditions, we find it common. This writer believes that trachoma is not extended through the school, but that it usually occurs at home, and from here is brought into the school, and that we must therefore consider it from a standpoint of attack of a childhood disease that must first receive proper attention in the home.

Thus, from an enormous amount of material presented at the Congress, the writer, from notes taken at the time, through the process of his own memory, and by references made to the reports, has attempted to present certain vital aspects of an important world problem. Certainly enough has been presented to indelibly force upon us the menace of trachoma. There can be no doubt that it is as much a world problem, and quite as important as the world fight against tuberculosis, lues, and other infectious and epidemic diseases. Every possible point of entry into our land should be guarded; and, of course, much has been done and is being done now in this regard. Sporadic manifestations of the disease should be treated by intelligent and competent health officers and ophthalmologists. All cases of an individual sporadic nature should be reported and treated immediately and kept under supervision. We must keep in mind that the disease finds its more fertile soil in unclean habits of life and unhygienic surroundings. While we are not generally, or severely, afflicted in the United States, the disease should nevertheless receive the most thorough attention, both from the state, health officers, and ophthalmologists. There is another aspect of the question that concerns international relationship. Not only should we attempt to stamp out the disease entirely from our own country, but we should be willing to help the less favored countries thus afflicted, by all the means we have at our possession. This is not only from the correct humanitarian standpoint, but it is vitally necessary for the protection of both ourselves and our neighbors. As stated, very little was said at the Congress regarding treatment, and probably for the reason that there is a very general agreement upon the different forms of this throughout; proper surroundings, prophylactic measures to prevent its spreading, avoidance of contact in the immediate family and inner circles, and the use of local medication. The writer remembers, while talking with Prof. Fuchs some time ago regarding this disease, that the latter told him that among all the different medicines tried in Vienna, none seemed to be so efficacious as copper sulphate. The writer of this article, while frequently using this in the form of the copper stick, supplements it by a few drops of a 5 per cent solution of copper sulphate in glycerine, dropped into an eye cup half filled with distilled water, in the eyes morning and night, by the patient at his home. Silver may at times be alternated, but ofttimes irritates more than it does good. It seems to be better in its effects in very acute phases, and for the manifest reason that the superficial layers of the conjunctiva are markedly affected by it and are thrown off. Tannic acid in glycerine is also a very efficient drug to alternate with copper sulphate. It is also very important, as in all inflammatory conditions of the conjunctiva with much secretion, that a bland unguent such as petrolatum or alboline be smeared along the palpebral borders before the patient retires. This prevents retention of materials during the night. These therapeutic suggestions are simply from personal experiences of the writer himself, and not reflections from the Congress.

Roche of Marseilles, in a report concerning the clinical studies as to infection in cases of trachoma, states that these lead to two references:

1. For the carrying of trachoma to others, an intermediary (a host) or additional factor, is necessary. The greater or lesser profusion of that coöperating factor would determine the greater or lesser frequency of the infection. This explanation is not very plausible, though it cannot be excluded with certainty in the present state of our knowledge.

2. Trachoma is only infectious during a short period. If this supposition should be confirmed by clinical or experimental examination, this would, as a matter of course, greatly simplify the combating of trachoma. It would be sufficient to isolate the patients during the period of infection in order to prevent all spreading of the affection.

418 Insurance Exchange Bldg.

MALARIA AND ANOPHELINE MOSQUITOES IN MINNESOTA

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IT is very generally believed by medical men, and by others interested in public health, that malaria cannot originate in Minnesota. The idea is not supported by the facts and though the local appearance of the disease is very exceptional the possibility of sporadic cases should be recognized.

During the summer of 1929, Dr. O. McDaniel, of the State Board of Health, called the writer's attention to a case of clear-cut local origin in the practice of Dr. A. E. Meinert of Winona. The patient, a city fireman, had not been out of the state in five years' time and had not been sick before. Blood smears showed heavy infection with benign tertian malaria.

Sanford (1913) reported another case clearly acquired in Minnesota. It was that of a child two years of age, whose residence and birthplace was Oronoco, Olmsted County, and who had never been out of the state. Blood examination revealed a double infection of the tertian parasite, with many typical specimens of *Plasmodium vivax*.

He also reported a typical case of malaria in a woman of 35, who was born in Michigan, had lived for many years in North Dakota and for the three years preceding examination, in Wisconsin. He states that Dr. L. F. Germain had reported before the Milwaukee Medical Society two cases of malaria clearly contracted in Wisconsin during the summer of 1911. Coon and Overton (1923) refer to six imported cases which had been treated in the infirmary of the University of Wisconsin, at Madison. Discussing the possibility of locally acquired infection they cite three cases which had occurred in the practice of other physicians.

Doubtless there are a number of other cases in both Minnesota and Wisconsin which have come to the attention of practitioners and have not been reported. The infection may even be completely unrecognized because of the belief that malaria does not occur in the state.

An instance in point came to the attention of the writer several years ago. Following a tonsillectomy a patient in one of the hospitals of the Twin Cities exhibited a considerable rise in temperature which was the occasion of some concern until he himself suggested that he had malaria, a disease which he had previously suffered from in his southern home. Blood examination showed that this was the cause of the fever, a latent infection which had been stirred up by the operation.

Similarly, students returning to the University after summer vacations spent in the West or in the South occasionally exhibit an acute attack of malaria remote from the source of infection, or summer tourists may suffer a relapse of the disease while camping in Minnesota.

Of course, cases such as those cited above could not give rise to endemic infections in the absence of mosquitoes capable of carrying malaria. The significant fact is that we have in Minnesota two species of Anophelines, both of which are demonstrated transmitters of the disease. *Anopheles punctipennis*, a vector of both tertian and æstivo-autumnal malaria is fairly common in the Twin Cities. I have taken it repeatedly in the buildings of the State University. C. W. Howard, 1916, has had the same experience, and reports for Savage, Minnesota, as well. Evidently this is the same species reported by Taylor, 1910, under the name *Anopheles maculipennis*.

Anopheles quadrimaculatus, the potential carrier of all three types of the disease, has likewise been taken repeatedly at St. Paul and there is in the University collection a specimen labelled Grand Rapids, Minnesota.

According to Sanford, 1913, "In 1903, Dr. H. P. Johnson, then Professor of Bacteriology in St. Louis University, noted the presence of numerous Anopheles mosquitoes in the vicinity of Ely, Minnesota." There is no indication as to species, but in all probability they were of one of the above-mentioned.

With the increasing tourist influx and especially with the establishment of our numerous tourist auto camps, the possibility of infection

of Anopheles mosquitoes is by no means a remote one. According to the report of the "Ten Thousand Lakes Association" it is estimated that more than one million, six hundred thousand tourists visited the state during the summer of 1929. In each of the 381 recorded tourist camps there was an average number of 33.27 persons staying daily. This would give a total daily number of 12,675 staying at these camps scattered over the state. Many of these came from malarious sections of the country and doubtless a significant number are actual carriers of the parasite. The writer several years ago made an examination of a group of twenty young men who had come to Minnesota from Arkansas and found two of them to be malaria carriers.

Moreover, with the increasing use of induced malaria in the treatment of paresis there is an additional very definite possibility of mosquito infection and subsequent transmission. The idea that the organisms from these patients are not capable of developing the parasite cycle in the mosquito is altogether fallacious.

That isolated carrier cases may become foci of local outbreaks has often been established. Craig (1909) points out that, "Local epidemics of malaria are often observed in places which may have been free from infection for many years. An instance of this kind occurred under my observation in a city in Connecticut. Some years before the Spanish-American war this city occasionally reported the presence of tertian malarial fever, but the cases were few in number and no other form of malaria was ever observed. After the return of a company of militia at the close of the war mentioned, several cases of remittent fever were observed which, upon investigation, were found to be infections with the æstivo-autumnal malarial plasmodia. The introduction of this organism was traced to returning soldiers, some of whom had suffered from this form of malaria while in Cuba upon special service. In this instance the conditions necessary for the spread of the disease were all present in the city with the exception of the infected individuals, the right species of Anopheles, warmth and moisture, a susceptible people awaiting only the returning soldier infected with the æstivo-autumnal plasmodium, and thus a form of malaria never before observed in the State of Connecticut became prevalent in this city."

It is significant that early records show that "ague" was commonly present in Minnesota during pioneer days. Making due allowance for imperfect diagnosis, it is obvious that the disease was brought in repeatedly from malarious regions, prevailed for a time and then, since conditions for its continued propagation were unfavorable, it pratically disappeared. These unfavorable conditions were largely climatic, since Minnesota lies about at the northern limits of the distribution of the disease in the United States. This limit, according to Hirsch (cited by Marchiafava and Bignami, 1900), is between the isothermal lines of 15° and 16° C. (59° and 60.8° F.), mean summer temperature. The United States Weather Bureau shows that for twenty years the entire state had a mean summer temperature slightly above 60° F.

The conditions outlined make it certain that sporadic cases of malaria in Minnesota are to be reckoned with. That they will ever be common is quite out of the question. Climatic conditions, the short season, with its relatively small population of anopheline mosquitoes, together with the remote mathematical possibilities of just the right combination to insure transmission, all preclude possibility of more than rare cases.

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CASE REPORTS

CONGENITAL VALVULAR OBSTRUCTION OF THE POSTERIOR URETHRA

REPORT OF A CASE

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The occurrence of abnormal folds or valves in the male posterior urethra causing varying degrees of urinary obstruction is now recognized as a pathological entity. Tolmatschew, in 1870, gave the first complete discussion of the subject, while Eigenbrodt, in 1891, probably discovered the condition for the first time in a living subject, upon whom he was operating for an obscure urinary obstruction.

Knox and Sprunt, in 1912, were the first to report a case in America. Young, in 1913, however, made the first clinical diagnosis of the condition and corrected it surgically with a successful result. Young, Frontz and Baldwin in 1919 collected from the literature twenty-two cases of congenital valves of the posterior urethra. These were cases found at autopsy. In the same article were reported twelve cases seen in the urological and pediatric clinics of the Johns Hopkins Hospital. In eight of the latter cases diagnosis had been made clinically and successful surgical procedures instituted for the removal of the obstruction. The other four cases in this series were not operated on, and died. In 1925 Hinman and Kutzmann, in a comprehensive review of the subject, reported twenty-one additional cases, six of which were observed in their personal practices, thus bringing the total number of cases reported to date of congenital valvular obstruction of the posterior urethra to fifty-six.

Young, Frantz and Baldwin have described three definite types of the anomaly. The first type is characterized by a ridge-like fold extending downward from the verumontanum and dividing into two membranous sheets. The outer edges of these sheets attach themselves to the rectal, lateral and pubic walls of the urethra as they extend distally; the inner or free edges may or may not unite below. In some cases of this type only a single unilateral valve is present. In the second type a ridge similar to that of the preceding type is found, but it passes upward from the verumontanum and divides into two valve-like folds which attach to the urethra just outside the vesical sphincter. The third type is a more or less disc-shaped valve, the outer edge of which is attached to the entire circumference of the urethra; a small opening toward its center prevents complete urinary obstruction. The latter variety of valve may be found in any portion of the posterior urethra and bears no relationship to the verumontanum. The valves in the following case are similar to those described in type one.

*From the Department of Urology, the Miller Clinic.

CASE REPORT

E. B., age three and a half years, male.

Complaint: difficult painful micturition, abdominal distention. Swelling of face.

Family history: Irrelevant.

Past history: Normal delivery. Breast-fed fourteen months. Chickenpox, measles and occasional "colds."

Present illness: The mother states that since birth there had been noted severe straining to empty the bladder, but for the past two months patient has cried whenever he urinated. He would strain, stand on his toes and finish the act by bending over and grasping the lower abdomen. Circumcision was done elsewhere five weeks ago, without benefit. Within the past month straining at urination became more marked and there was a protrusion of the rectal mucosa through the anal sphincter whenever micturition was attempted.

Since the onset of the dysuria there has been marked frequency and urgency of urination day and night, with the passage of only small quantities of urine. The stream has been slow in starting, with poor force and sudden cessation while straining. During the week prior to admission to the hospital a swelling of the face was noted, together with the appearance of reddish spots on the body.

Physical Examination: The patient is a boy three and a half years old, well developed, but sallow and appearing very ill.

Head and neck. The left eye shows recent hemorrhage beneath the sclera.

Throat. Negative. There is marked distention of the anterior jugular veins.

Thorax. Heart and lungs, negative. Pulse 110, regular. Temperature 100.2°.

Abdomen, distended. There is an ovoid tumor rising from the symphysis to well above the umbilicus.

Skin. Pale, with pinkish, red hemorrhagic spots on the lower abdomen and thighs. The superficial veins are very evident. The child is irritable, cries much of the time, and is apparently having marked lower abdominal distress.

External genitalia, normal.

The urine voided during the examination is grossly bloody.

Laboratory Data: Blood, hemoglobin 60 per cent. Red blood cells 3,540,000. White blood cells 14,650. Polymorphonuclear leukocytes 73 per cent, lymphocytes 27 per cent. Bleeding time, one minute, 25 seconds. Coagulation time 4 minutes.

Urine—specific gravity 1.008. Reaction acid. Albumin heavy cloud. Sugar negative. Microscopic—numerous leukocytes, clumps of pus. Many red blood cells.

Blood chemistry—Sugar 125 mgs. Creatinin 2.50 mgs. Urea Nitrogen 56 mgs.

The renal function was not determined because of

the distended bladder, which was to be decompressed.

X-ray—A cystogram (Fig. 1) shows the bladder outline irregular, trabeculated, with small cellules, and a dilatation of the bladder neck and posterior urethra. There is reflux up both ureters showing dilatation even though no attempt was made to force a large quantity of the opaque media into the bladder.

Cystoscopic Examination—This was preceded by preparatory catheter treatment. Buerger cystoscope (F. 16) inserted without difficulty. The bladder wall showed marked trabeculation. Numerous small cellules were seen. Both ureteral orifices were dilated and similar in appearance to large diverticulæ. The prostatic urethra was dilated, as was the internal sphincter, allowing easy manipulation of the cystoscope and inspection of the verumontanum. The superior crista appeared normal. The inferior crista showed redundant folds of mucous membrane, semilunar in shape, swinging downward and laterally, in a fan-shaped manner, with the apex at the verumontanum. These folds were



Fig. 1. Cystogram showing dilated posterior urethra and reflux up both ureters.

flattened by the cystoscope, but with a small urethroscope improvised from a trocar these folds could be seen to balloon out with the egress of fluid from the bladder.

Treatment—A cystotomy was performed. A thickened, trabeculated bladder was seen. The ureteral orifices were dilated sufficiently to be palpated. The posterior urethra and vesical sphincter were dilated, permitting the palpation of the valves on the end of a sound which had been caught in the pouch beneath. Division of the valves behind the end of the sound was carried out.

The patient made a slow recovery, and finally became afebrile. Gradually the pyuria disappeared, and the general condition rapidly improved. The urethra was dilated several times following the operation and he was voiding normally before leaving the hospital. He was seen two and one-half years later and appeared normal in every way.

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PHARYNGO-ESOPHAGEAL MEDIASTINAL FISTULA REËNTERING THE ESOPHAGUS*

REPORT OF CASE

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Mediastinal abscess, perforated blood vessels, and esophago-tracheo-bronchial fistula are some of the complications that may arise from ulceration as the result of an impacted foreign body in the esophagus. It is therefore imperative that all foreign bodies lodged in the esophagus should be removed as soon as possible, since perforation may take place in a short time, especially if the foreign body is large and has sharp edges.

Recently, a patient was observed in the clinic who demonstrated the rapidity with which perforation may take place, and who also presented one of the most unusual of complications, pharyngo-esophageal mediastinal fistula.

The patient, a middle-aged woman, a year preceding admission to the clinic, had choked while eating chicken, and felt the sensation of a bone sticking in her throat. Considerable pain and dysphagia followed. Nothing was done until the third day, at which time the patient felt very ill and uncomfortable, and esophagoscopy was advised. This failed to reveal the foreign body. The patient stated, however, that she thought she felt it pass down the esophagus and into the stomach just preceding the examination. The patient became progressively worse, and high fever and stupor developed. Evidence was found of a mediastinal abscess, which was drained on the tenth day through the left supraclavicular region, with excellent results, the patient recovering promptly. The dysphagia, although slight, persisted, and the wound in the left supraclavicular region continued to drain a small amount of mucoid material. In spite of further surgical interference, the sinus persisted although it drained very little. Approxi-

*Submitted for publication April 11, 1930.

mately every four or five weeks since the onset, the patient had experienced a sense of substernal pressure, malaise, slight elevation of temperature and an increase in dysphagia. Two or three days later, the sinus in the left supraclavicular region would usually open and discharge mucopurulent material for two or three days, it appeared to come in contact with a fluctuating mass. The following day the sinus in the left supraclavicular region opened and drained spontaneously. Roentgenologic examination following drainage revealed a sinus discharging from the bottom of the pharyngo-esophageal diverticulum into a large mediastinal pocket, with

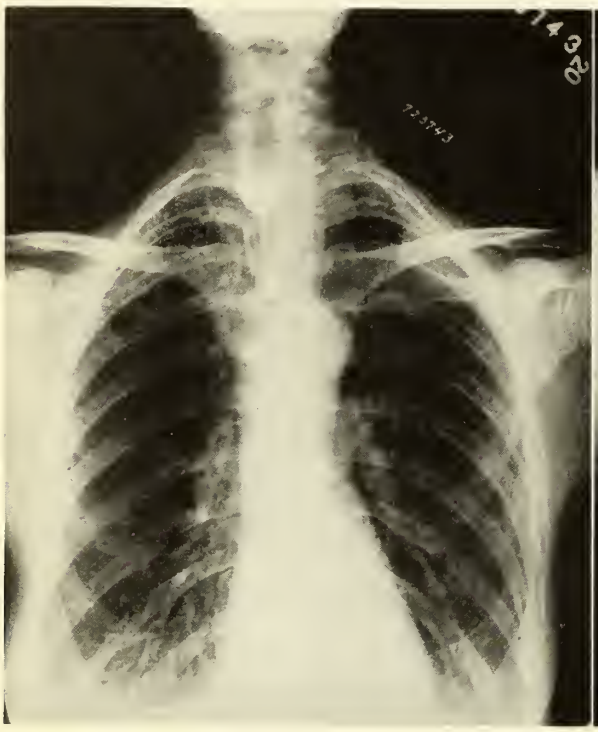


Fig. 1. Esophagus before discharge of material retained in mediastinal sinus.

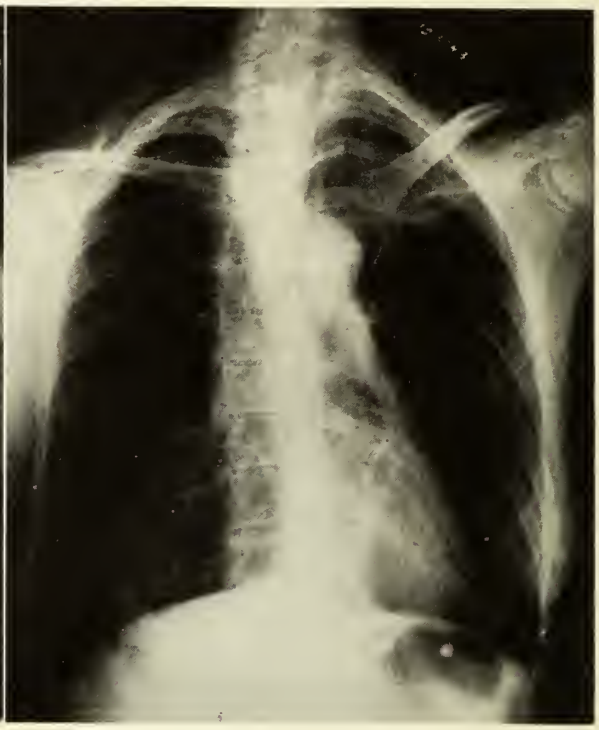


Fig. 2. Esophagus after drainage of mediastinal sinus.

which relieved the symptoms. During the time of drainage, small amounts of food that had been eaten would be discharged through the sinus. If the sinus in the left supraclavicular region did not open and drain to terminate the attacks of malaise, fever and dysphagia, the symptoms were relieved by something giving way in the thorax and discharging into the esophagus.

The foregoing cycle had repeated itself with great regularity, and at the time the patient presented herself at the clinic she felt such an attack developing.

On examination, the sinus at the base of the neck was dry, and very small. In swallowing, the patient made a peculiar noise, which is characteristic of pharyngo-esophageal diverticulum. Roentgenologic examination revealed a pharyngo-esophageal diverticulum (Fig. 1) with a small amount of barium lodged about the level of the arch of the aorta. On esophagoscopic examination the diverticulum was found filled with mucoid material, and there was obstruction in the upper third of the esophagus, which gave the impression of being due to an extrinsic mass. The passage of a number 41 French sound over a previously swallowed silk thread also demonstrated the diverticulum and the obstruction in the upper part of the esophagus. However, a number 45 French sound was passed with ease; a fistulous tract leading from the pocket to the left supraclavicular region, and another burrowing down the posterior mediastinum and emptying into the middle third of the esophagus (Fig. 2). Fluoroscopic examination disclosed that about equal amounts of barium passed down the esophagus and the sinus tract.

Apparently, the attacks of malaise, fever, dysphagia and substernal distress were the result of the tract emptying into the esophagus and becoming obstructed. The material accumulated in the mediastinal pocket until it was either discharged through the sinus to the outside, or into the esophagus, with relief of symptoms.

Undoubtedly the sequence of events in this case was the lodgment of a piece of chicken bone in the pharyngo-esophageal diverticulum, with perforation into the mediastinum and subsequent mediastinal abscess. Whether the bone went through into the mediastinum, or later was discharged into the stomach, is difficult to determine. The abscess was drained through the left supraclavicular region with the formation of a sinus tract, and the third opening into the middle third of the esophagus was undoubtedly spontaneous, although it may have been due to the foreign body burrowing its way back from the mediastinal pocket into the esophagus.

It was impossible to isolate the sac of the diverticu-

lum, and an attempt to remove it was not made. The fistulous sac was dissected out and excised. After the mediastinal sac had been drained and the sinus had filled in until it was small, the esophagus was dilated repeatedly. This seemed to give relief. When the patient was dismissed from observation she was apparently in good condition but we advised that the dilatations of the esophagus be continued.

INCORRECT LABELING OF UPSHER SMITH DIGITALIS PREPARATIONS

Tablets Folia-Digitalis (Upsher Smith) 1 grain, Tincture Digitalis (Upsher Smith) and Capsules Folia-Digitalis (Upsher Smith) 1 grain, were exempted by the Council on Pharmacy and Chemistry as having the status of official substances. The Council reports that a committee for the study of the actions of digitalis in patients suffering with pneumonia used tablets of digitalis Upsher Smith and tablets of digitalis of another firm and directed that patients receive these in uniform doses calculated to induce a moderate degree of digitalization, assuming that both specimens of tablets were correctly labeled; that after a total of 258 patients had been treated it was discovered that the tablets of digitalis Upsher Smith induced both severe and minor toxic symptoms far more frequently than those of the other firm, and that an examination of the records brought out that minor toxic symptoms were more than ten times as great in those who received the Upsher Smith tablets as in those who received the other firm's tablets and that the mortality was 49 per cent of all cases of pneumonia treated with the first, as compared with 38 per cent in all those treated with the other tablets. The Council further reports that both brands of tablets were then assayed; that the tablets of the other firm were found to be of activity stated on the label, and those of Upsher Smith to be twice the activity stated. Upsher Smith has assured the Council that any of his misbranded preparations on the market will be called in, and that in the future the greatest care will be taken to insure that the potency of these will be stated correctly. (Jour. A. M. A., April 26, 1930, p. 1305.)

THERAPEUTIC CLAIMS FOR THEOBROMINE AND THEOPHYLLINE PREPARATIONS

The Council on Pharmacy and Chemistry reports that, questions having arisen in regard to the advertising claims that might be permitted for the xanthine derivative preparations accepted for New and Non-official Remedies, the Council's referee for these products presented a review of the important literature, with special reference to the value of xanthine derivatives in vascular hypertension and arteriosclerotic conditions. In the light of this review, the Council decided that the following claims could be permitted for both theobromine and theophylline: (a) diuretic action; (b) myocardial stimulation; (c) occasionally (and more often with theophylline) relief of pain in angina and similar lancinating pains. It does not seem permissible to claim lowering of hypertension. (Jour. A. M. A., April 26, 1930, p. 1306.)

ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The Council on Pharmacy and Chemistry held its annual meeting at the Association headquarters March 7 and 8. Extended consideration was given to the work of the newly established Committee on Foods and the proposed publication of the book "Accepted Foods." The progress made appeared satisfactory and the work appears to be appreciated by the profession, the public and manufacturers. The Council discussed the status of the streptococcus preparations for the treatment of rheumatic fever made in accordance with the method of J. C. Small: it was the consensus that, while these products are suitable for controlled investigation by qualified experimental workers, propaganda which invites their general use is not justified at this time. The Council decided that the available evidence does not demonstrate the usefulness of puerperal fever streptococcus serum. The Council decided to continue the acceptance of Type I antipneumococcic serum for New and Non-official Remedies; that Type II serum is still in the experimental stage; and that pneumococcic serum preparations representing a mixture of Types I and II pneumococci be considered unacceptable. It was decided that, while adequate clinical evidence for the potency of a liver extract must be required before acceptance, further clinical testing will not be required after a product has been shown to be active and the method of preparation shown to be satisfactory. The Council considered the rules that are to govern the use of the seal to be used by manufacturers to identify products accepted for New and Non-official Remedies or for Accepted Foods. The Council approved a proposed study of commercial allergic protein preparations and offered coöperation. The Council considered a proposed manual for the guidance of hospitals to be prepared by a committee appointed by the Council on Medical Education and Hospitals with the coöperation of the Council on Pharmacy and Chemistry. Plans for the consolidation of various committees concerned with anesthesia were discussed. (Jour. A. M. A., March 22, 1930, p. 874.)

POTENCY OF ARSPHENAMINE

There is no official standard for therapeutic potency of arsphenamine preparations. According to reports of the United States Public Health Service Hygienic Laboratory, no one brand has been definitely established as superior to others when considered from the point of view of clinical efficiency. In some foreign countries, every preparation of arsphenamine and neoarsphenamine is tested on mice for therapeutic efficiency before being used. (Jour. A. M. A., November 9, 1929, p. 1495.)

President's Letter

NOT at all infrequently some one asks the question, "How shall I choose a good doctor?" One may answer, giving many rules of guidance of more or less doubtful value, the while a still, small voice within whispers the query, "What *is* a good doctor?" Surely we must know something of what enters into the making of a good doctor before we can tell a person how to make a wise selection. Without making any attempt to answer the question it is permissible to cogitate.

Youth finishes his interneship, receives his diploma from a Class A school of medicine, successfully meets the requirements of the laws of the state in which he decides to open his office and goes to work. If he has given reasonably faithful attention to his duties before entering upon the practice of his profession, it is safe to say that he is in a position to give intelligent attention to such cases of illness as may come his way. He has abounding hope and energy. His optimism is contagious, his energy appeals, his pleasing personality attracts. Directly he is busily working, is riding a wave and surely floating to its crest.

When youth opened his office he was not a good doctor as yet. He had but started to explore the field of *experience* now opening before him. He is about to learn to be a doctor. The element of *time* now enters the equation, without which experience may not be had. What his experiences are, what they will mean to him, will depend largely upon what he does with the time he is using. If he has wisdom as a reasonably well developed attribute his time will be spent (excepting such as is justly his for rest and recreation) in carefully recording his observations, classifying his records, comparing them, thinking of the significance of his findings. Thus knowledge born of experience will grow. His *judgment,* a final and deciding factor in the making of a good doctor, will have ample opportunity to develop. If he possesses that keen discriminatory quality which we call good judgment he is well on the road to becoming a good doctor.

But the years are passing and youth is slipping away into maturity. At some point along the way the lines of life diverge. One leads to lost interest, indifference, self-satisfaction, professional mediocrity, or less, and a flabby minded old age unless death mercifully intervenes. The other leads into fresh and increasingly interesting fields. It gives breadth of understanding, it enhances the value ofexperience, it fixes firmly in the mind the lessons learned through observation and study. This line of life is marked by an insatiable thirst for knowledge. It compels him who follows it to seek for the knowledge and tales of experience of his fellows. In season and out he cries for more. This line leads him to his local medical meetings, to the state meetings, to such of the special meetings as his taste dictates. Staff meetings, if available, he surely attends. He will make flying trips to medical centers where he may spend a profitable hour with some great clinician, or at a pathological conference or an *x*-ray demonstration. Perchance he may have quiet converse with some learned mind for a little time. Thus he adds to his knowledge, makes his experiences mean something, ripens his judgment and gets zest and inspiration with which to continue his labors.

From this picture we may see clearly that work, work of the right sort, returns rich dividends in knowledge and skill and mental and moral satisfactions. As work of this sort may be done in small and out of the way places as well as in the great cities it is reasonable to suppose that "professional ability is pretty evenly distributed over the country, reputation is largely a matter of chance."

Departing from the field of cogitation to matters of fact it may be stated that in making up the scientific program for the July meeting of the State Society the committee in charge wrote letters to all members asking them to express their choice of subjects for a series of six symposia. An amazing number of answers were received. A great variety of subjects were named. The Program Committee merely acted as a clearing house for the profession at large which chose the following subjects:

1. Traumatic Surgery.
2. Carcinoma. The request here was that the most recent etiological factors together with early diagnostics be stressed.
3. Rheumatic Fever. The men appeared to be aware of new developments concerning rheumatism and expressed a wish to learn the latest.
4. Anesthesia. Clearly the profession is interested in all modern methods. Succinct definite and correlated information will be given.
5. Therapy. This subject was almost universally requested.
6. Our State Institutions. A large number of people, both lay and professional, desire to know how to get persons in and how to get them out; what is done for the inmates and how they get along. The profession evidently feels that the fine body of men in charge of these institutions are members of the profession and better acquaintance is desired.

Judging from the great flood of letters received by the Program Committee practically the entire membership of the State Society classifies for cogitative life line number two. On that basis the Duluth meeting will be immense.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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Vol. XIII June, 1930 No. 6

THE MINNESOTA MEDICAL SCHOOL AND THE JULY KIDNEY SYMPOSIUM*

There is a rather brief announcement in this Journal in the May issue (page 335) of this most noteworthy educational step, planned and executed through our Professor of Medicine, Hilding Berglund. This extraordinary assemblage of men from near and far, who have made names for themselves in medical science and have noteworthy contributions to discuss in the special field pertaining to normal and abnormal kidneys, is a unique evidence of Professor Berglund's wide acquaintance and the confidence these men have in him. It is likewise an evidence of the high position in medicine granted both to our own state and its university, because these men do not casually abstract this precious time from the very best portion of their summer vacation periods.

This set of lectures is going to draw together those interested from near and far. To some, uninitiated, it may appear that the field of kidney physiology and pathology is singularly limited, and that a greater variety of subjects should be discussed. With this contention few will agree.

In the first place we might paraphrase the remark of the old teachers who said, "He who understands syphilis thoroughly in all its manifestations understands all disease." So let us say in particular that the kidney is capable of study from the widest angle of approach; it is pivotal among organs; its blood supply and its anatomical position as well as its avenues of excretion provide easy isolation. When Professor A. N. Richards, for example, demonstrates to us his superb work on kidney capillaries and their distribution he is virtually introducing us to the body capillary bed as a whole. A full knowledge of kidney physiology would mean a long step toward knowledge of the body as a whole.

We have all talked about kidney classifications and the name of Volhard comes first to mind. Many might find it disconcerting whether to place him in the time of Harvey or Virchow. It will be as comforting as impressive to see him in the living—and incidentally observe the distance he travels to be with us!

This sketch is something of a summons or challenge to our state of hibernation or inebriety. We must not sit purposelessly by, unaware of this great treat and opportunity. Let us give these men an audience; let us linger about the University on some of these days at least; let us not fail to show to Professor Berglund, the other University men and their guests our full appreciation of this evidence that our medical school has not only a commanding position, but an intense zeal to come into a position second to none.

E. L. TUOHY, M.D.

*July 7 to 18 at the University Medical School.

"JAKE" PARALYSIS

"Jake" paralysis has recently been given wide publicity in the lay press. Reports are that many have been stricken in Oklahoma, Kansas, Illinois and Massachusetts. The prime offender is Jamaica Ginger, which masquerades under the name of "Jake." Reports have it that it has been dispensed at soda fountains, soft drink parlors, and has even been "bootlegged."

A number of years ago weaker extracts of ginger were on the market, and a propensity for drinking them grew up in the prohibition states, and during the early days of national prohibition. However, even the so-called "Jake" addicts were unable to drink the U.S.P. extracts, with its 4 per cent of ginger. Manufacturers of extracts designing to meet this beverage demand, therefore, used only about one-half of 1 per cent of ginger extract, and made up the rest of the 4 per cent non-volatile matters by preparations which cannot easily be detected by the drinker, and which will pass a superficial test for solid content. Such adulterants as castor oil, other bland viscous oils, powdered resin, pine oil, tar and oleoresin have frequently been discovered. Lately creosol and phenol products have been discovered.

The exact nature of the poisonous product is as yet unknown. The probabilities are that it may be a higher alcohol. Clinically these cases resemble typical alcoholic polyneuritis, with partial, or complete, paralysis of the distal portions of the four extremities.

Jamaica ginger may be manufactured only under permit from the Bureau of Prohibition, but it is believed that many manufacturers make this sub-standard ginger to the order of distributors, who supply their own labels, and who are, therefore, free to resell the product to grocery stores and other vendors, practically free from Government interference, because the extract conforms to the Food and Drug Acts in label requirements, and apparently as to solid content. The Government is endeavoring to trace these products to their source of manufacture, and close them up if it cannot be shown that the adulterants were not added after the shipment left the manufacturer. That this has proved to be a difficult task is shown by the widespread appearance of another product of Prohibition—the so-called "Jake" paralysis. Just how serious, from a prognostic standpoint, this form of paralysis is, cannot be stated at this time. Neuritis resulting from "moonshine" has often been found to be very prolonged and disabling. It is probable that the same situation, or a worse one, will result from this unknown poison.

G. N. R.

UROSELECTAN

The newly developed iodine preparation known as Uroselectan promises to be of very material assistance in the diagnosis of kidney lesions. Being a stable iodine combination it can be given intravenously with slight chance of iodism resulting, and its excretion by the kidney visualizes the urinary tract in the *x*-ray film. Occasionally the patient experiences a general reaction with digestive disturbances, pain in the arms, etc., which may be due to delayed elimination or drug idiosyncrasy.

With the technic used at present the kidney, pelvis and first part of the ureter and the bladder may show up well in the *x*-ray. The middle and lower portions of the ureter evidently do not contain the opaque urine in sufficient quantity to render much information as to the condition of this portion of the tube.

It is evident that even with improvement in the present technic being tried out by urologists, this new method can never entirely replace cystoscopic examination. In instances, however, where cystoscopy is contraindicated or where ureteral catheterization is impossible, or the pelvis cannot be injected, uroselectan intravenously can give information not otherwise obtainable. In cases of hydronephrosis or hydroureter this newer technic should give conclusive evidence.

This new preparation may acquire a very important place by replacing the opaque solutions usually used to visualize the urinary tract. It is thought by some to be less irritating and promises to give just as clear-cut pictures as the iodide solutions now used.

It is to be hoped that the intravenous use of uroselectan will not prove to be simply another *x*-ray examination to be used indiscriminately. This is not likely, however, for it involves an intravenous administration and *x*-ray exposure at half-hour and hour and a half intervals, and does not give the last word regarding the state of the urinary tract.

The interested reader is referred to two abstracts on the subject which appear in this issue.

OF GENERAL INTEREST

Dr. Joseph Borg, Saint Paul, who is at present taking post-graduate work in internal medicine in Vienna, is expected to return July 1.

Dr. Walter D. Abbott, formerly of the Mayo Clinic, Rochester, is now associated with Dr. Harry A. Collins at 820 Equitable Building, Des Moines, Iowa.

Dr. E. De Witt Simpson has moved into his new offices at 401 Medical Arts Building, Minneapolis, where he is engaged in the practice of general surgery.

Dr. Donald C. Smelzer, for the past five years superintendent of the Miller Hospital, Saint Paul, has been appointed superintendent of the Graduate Hospital, Philadelphia, where he will take over his duties July 1.

The Minneapolis General Hospital is now offering a six months' technician's course in electrocardiography and medical photography. Information concerning the course may be obtained from the superintendent, Dr. Walter E. List.

The Samuel D. Gross Prize of the Philadelphia Academy of Surgery has been awarded by the Trustees to Dr. Emile Holman, Stanford University Hospital, San Francisco, California, for his essay on "Abnormal Arterovenous Communications."

THE JOHN PHILLIPS MEMORIAL PRIZE

The American College of Physicians announces the John Phillips Memorial Prize of $1,500.00, to be awarded for the most meritorious contribution in Internal Medicine and sciences contributing thereto, under the following conditions:

1. The contribution must be submitted in the form of a thesis or dissertation based upon published or unpublished original work.
2. It must be mailed to the Executive Secretary† of the American College of Physicians on or before August 31, 1930.
3. The thesis or dissertation must be in the English language, in triplicate, in typewritten or printed form, and the work upon which it is based must have been done in whole or in part in the United States or Canada.
4. The recipient of the prize would be expected to read the essay at the next annual meeting of the College, after which he would be officially presented with the prize by the President.
5. The College reserves the right to make no award of the prize if a sufficiently meritorious piece of work has not been received.
6. The announcement of the prize winner will be made not later than two months before the annual meeting.

†Address American College of Physicians, E. R. Loveland, Executive Secretary, 133-135 S. 36th Street, Philadelphia, Pa.

The nurses of the Third District of the Minnesota State Registered Nurses Association have announced the following schedule of fees for private duty nursing in hospitals, effective April 1, 1930: 12 hour duty—$7.00 per day; 10 hour duty—$6.00 per day; 8 hour duty—$5.00 per day.

Dr. Harold D. Palmer, formerly of Saint Paul, graduate of the class of 1927, University of Minnesota, has recently announced his association with Dr. Edward A. Strecker of Philadelphia, in the practice of Neurology and Psychiatry. His offices will be in the new Institute for Mental Hygiene of the Pennsylvania Hospital, Philadelphia.

Beginning this year the American Association for the Study of Goiter will award a cash prize of $300 annually for the best original thesis dealing with some phase of the goiter problem. Theses should be submitted by June 1, to Doctor Walter M. Simpson, Chairman of the Essay Committee, Miami Valley Hospital, Dayton, Ohio. The award will be given immediately following the coming meeting of the Association which is to be held in Seattle, Washington, July 10 to 12, 1930.

STATE ASSOCIATION NEWS

Five Minnesota cities have booked the 1930 medical short courses offered under the auspices of the Minnesota State Medical Association and the University of Minnesota Extension Division. Wadena and Faribault were the last to book them. They opened the series the week of May 12. Willmar, Brainerd, and Winona preceded them.

Meetings took place in Faribault, May 19, and in Wadena, May 23, with executive officers of the association in charge of both. The tuberculosis meeting, arranged by the Minnesota Public Health Association, was held in Faribault, May 26. It is scheduled for Wadena, June 6. Program devoted to cancer, obstetrics, heart disease, arthritis, hospital management and other subjects chosen by the individual county medical societies sponsoring the courses are also scheduled.

F. Manley Brist, investigating attorney for the State Board of Medical Examiners, addressed the Blue Earth Valley Medical Society at Fairmont, May 1, on legal aspects of association affairs.

Officers of the state association addressed a special meeting of the Freeborn County Medical Society at Albert Lea on their way home from the 1930 convention of the Iowa State Medical Association, May 15. S. H. Boyer, president, E. A. Meyerding, executive secretary, and F. Manley Brist, were in the party.

Materials for lay talks on sex hygiene, diphtheria, child health and for a nurses' graduating exercise were sent from state association headquarters to members requesting them this month. This service is available to any member. Address the Minnesota State Medical Association, 11 W. Summit Avenue, St. Paul, Minn.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

A Public Health Program for the Doctors' Wives

An important and interesting health program evolved by the Women's Auxiliary of the American Medical Association is now before the Public Health Education Committee of the State Association.

This program proposes a very comprehensive lay health education study for county auxiliaries. It is designed, naturally, to cover the entire United States and whatever problem particularly confronts any given community.

The program has already received the approval of the American Medical Association Advisory Council. It is now submitted to the Minnesota Committee by the Auxiliary for approval and criticism and also for selection of what may particularly apply to the general situation in Minnesota.

The Committee has not yet acted upon the program though action is pending. A résumé of the fundamentals upon which the entire proposal is based and the general outline of study follows below for the information of members of the profession in Minnesota in whose communities its effects may be far-reaching.

The fundamentals upon which improvement of public hygiene should be based, according to the proposed program, are, briefly:

1. Recognition of the fact that public health is a highly technical job requiring scientific, technically trained workers.
2. Recognition of the fact that every state, county and city is entitled to a scientific full-time health department.
3. Recognition of the fact that the first and most fundamental job for lay organizations like the Auxiliary is to secure such a department for their city, county or town.
4. Recognition of the fact that where such departments do not exist health activities must be initiated and carried on by volunteer organizations.
5. Recognition of the fact that no health department of whatever kind can do effective work without the intelligent coöperation of the public.

Health officials know, says the national auxiliary, that it is not always the work which makes the greatest emotional appeal to the public which most needs to be done. Unfortunately most women do not know this. It is something that doctors' wives might well undertake to teach other women.

The National Auxiliary recommends, therefore, that each state auxiliary undertake, under the direction and with the help of the Public Health Committee of the State Medical Association, to study the following:

1. Fundamental principles of health promotion and disease prevention.
2. The set-up considered essential by public health experts for an effective state health department, of qualifications of personnel, budget and the like.
3. State health machinery and conditions.

Recommendations for educational work to be done by individual county auxiliaries are to be based upon the conditions found.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of June will be as follows:

June 4—Cardiac Neurosis.
June 11—Minnesota Department of Health.
June 18—Pyelitis in Young Girls.
June 25—Pituitary Gland.

STATE MEDICAL MEETING

A crowded three days' program is practically complete for what promises to be the most important and valuable state meeting in the history of the Minnesota State Medical Association.

It opens in Duluth, July 15, less than two months from the date of this issue of MINNESOTA MEDICINE, and the program committee wishes to remind members of the association that hotel reservations should be made immediately.

Positive confirmation has been received of the participation of Primarius Lorenz Boehler, Chief Surgeon and Director of the Vienna Accident Hospital, in the symposium on traumatic surgery, which is one of the most keenly anticipated features of the meeting.

Medical men who have been to Vienna recently have been attracted by Boehler's Clinic because of his original ideas in treating fractures. They have all been impressed with the rationality of his treatment and the brilliancy of his results. A great part of his work originated during the World War but he had become quite highly specialized in his work even before the war. In the past nineteen years he has treated more than 10,000 fractures, studied 27,000 roentgenograms, dissected more than 3,000 fractures on the post-mortem table. The latter was done because of dissatisfaction with the end-results with fractures, that he might study the cause of the failures.

Perhaps no other organization in the world is more highly efficient for treatment of fractures than that of Professor Boehler of Vienna.

The distinguished Viennese surgeon will arrive in America early in June. His method of reduction of fresh fractures has caused a sensation in the medical world. It is accomplished painlessly by local anesthesia and in such a manner that the period of treatment is greatly shortened. The Boehler method of treatment will soon be universal, we are told, and the presence of the eminent surgeon should add enormously to the interest in this symposium.

Among other important guests from outside the state who will be present for the meeting are: Karl Meyer, Chicago, Assistant Professor of Surgery at Northwestern University, and Medical Superintendent of Cook County Hospital; Ralph Kinsella, St. Louis, Professor of Internal Medicine at St. Louis University; Arnold S. Jackson, Jackson Clinic, Madison, Wisconsin; E. C. Davidson, Detroit, Junior Surgeon, Harper Hospital, and Attending Surgeon at the Children's Hospital of Michigan; R. S. Dixon, Director of the Division of Social Hygiene, Detroit Department of Health; W. J. Burns, Executive Secretary, Wayne County Medical Society, Detroit; J. G. Crownhart, Secretary, Wisconsin State Medical Association, Madison; Olin West, Secretary of the American Medical Association, Chicago.

Four other important symposia, selected by popular vote of members, are on the program. They will be on Immunology, Malignance, Rheumatic Fever, and Anesthesia.

One evening will be given over to a discussion of the economic trend of medicine; another, to fraternity meetings, and another to the annual banquet of the association.

The Canti film called, "A Cinematograph Demonstration of Living Tissue Cells Growing *in Vitro*," will be shown also as a feature of this year's meeting. It has been secured in response to numerous requests to the committee.

Arrangements for reception of members are practically complete under the direction of the Duluth committee. Attractive entertainment for wives of members has had especial attention.

The complete scientific and entertainment program will be ready for publication in the July issue of MINNESOTA MEDICINE. Watch for it!

SYMPOSIUM ON THE KIDNEY IN HEALTH AND DISEASE

Previous announcement of this unusual opportunity which comes to the very door of Minnesota physicians has already appeared in our columns. While of peculiar interest to internists the subject has a very general appeal.

An effort will be made to correlate many of the known facts under the heading of the anatomy, physiology and pathology of the kidney, with special emphasis on the newly discovered facts regarding the kidney and recent investigative work.

The meeting will open Monday, July 7, 1930, at the University hospital and will continue until Friday, July 18, with an intermission from Saturday noon, July 12, to the following Tuesday to enable attendance at the State Medical meeting in Duluth, which opens July 14. Meetings will begin at 9 A. M. each day and will include morning and afternoon sessions with round table discussions in the evening.

A glance at the following list of well known participants should indicate the treat that is in store for members of the profession:

Dr. A. J. Carlson, University of Chicago.
Dr. G. Carl Huber, University of Michigan.

Dr. E. K. Marshall, Johns Hopkins Medical School.
Dr. R. E. Scammon, University of Minnesota.
Dr. C. M. Jackson, University of Minnesota.
Prof. F. Volhard, Frankfort-on-the-Main.
Dr. A. N. Richards, University of Pennsylvania.
Dr. E. T. Bell, University of Minnesota.
Dr. R. N. Bieter, University of Minnesota.
Dr. H. L. White, Washington University, St. Louis.
Dr. W. F. Longcope, Johns Hopkins Hospital.
Dr. Paul B. Rehberg, University of Copenhagen.
Dr. L. G. Rowntree, Rochester, Minnesota.
Dr. H. Berglund, University of Minnesota.
Dr. A. D. Hirschfelder, University of Minnesota.
Dr. L. Leiter, University of Chicago.
Dr. R. A. Gortner, University of Minnesota.
Dr. Harold Diehl, University of Minnesota.
Dr. McN. Wetherby, University of Minnesota.
Dr. H. P. Wagner, Rochester, Minnesota.
Dr. G. E. Fahr, University of Minnesota.
Dr. N. M. Keith, Rochester, Minnesota.

All correspondence in regard to the symposium should be addressed to the Symposium, University Hospital, Minneapolis, or direct to Dr. Hilding Berglund, University Hospital, Minneapolis.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meeting of the Scott-Carver County Medical Society was held at New Praque on May 13, 1930. Dr. G. T. Schimelpfenig, of Chaska, was elected to membership in this society. The Honorable Judge C. M. Tifft read a very instructive paper on "Medical Jurisprudence." Dr. E. E. MacGibbon, from the University of Minnesota Dental School, gave a very interesting and instructive address on "Diseases of Mutual Interest to a Doctor and Dentist."

Dr. F. A. Dodge, of LeSueur, one of the charter members of this society, made a few remarks about the beginning of the society. Mr. A. J. Suel, editor from New Prague, gave a short but interesting address on "The Press and the Medical Profession." A rising vote of thanks was given the speakers. It was decided to hold our next meeting, which will be the annual meeting, at Shakopee in June, 1930.

B. H. Simons, M.D., *Secretary.*

MEEKER COUNTY MEDICAL SOCIETY

S. S. Dulude, Dassel, was recently elected president of the Meeker County Medical Society. K. A. Danielson, Litchfield, will be secretary and treasurer; A. W. Robertson, Litchfield, will be delegate; H. E. Wilmot, Litchfield, will be alternate; and D. C. O'Connor, Eden Valley, and A. W. Robertson, Litchfield, will serve as board of censors for the society.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

New officers of the Stearns-Benton County Medical Society are: President, E. M. Kingsbury, Clearwater; Vice-president, H. B. Clark, St. Cloud; Secretary, P. E. Stangl, St. Cloud; Treasurer, F. J. Schatz, St. Cloud; and delegate, C. B. Lewis, St. Cloud.

NORTHWEST PEDIATRIC SOCIETY

Dr. Erling S. Platou of Minneapolis was elected president of the Northwest Pediatric Society at the annual meeting. Dr. E. D. Anderson of Minneapolis is vice president, and Dr. F. G. Hedenstrom of St. Paul, secretary-treasurer.

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

The Redwood-Brown County Medical Society held its annual meeting at New Ulm Union Hospital, May 14, 1930. After a banquet the following were elected to office:

President, Dr. G. F. Reineke, New Ulm; vice-president, Dr. Herman Just, Lafayette; secretary-treasurer, Dr. Wm. A. Meierding, New Ulm (re-elected); delegate to 1931 convention, Dr. Theo. Hammermeister, New Ulm; alternate, Dr. F. H. Dubbe, New Ulm.

Appointment of committees was as follows:

Publicity Committee, Drs. Weiser, Kiefer and Rothenburg. Committee on Public Policy and Legislation, Drs. Rothenburg and Hammermeister. Committee on Maternal and Infant Hygiene, Drs. Weiser and Jamieson.

Mr. F. A. Augustin, of Minneapolis, put on the screen three films showing "Movement of Alimentary tract in Experimental Animals," "The Influence of Drugs on Gastro-intestinal Motility," and "The Anatomy of the Abdominal Wall."

Attorney Linus Glotzbach, of New Ulm, gave a talk on "Medical Economics."

Dr. Herman Just, of Lafayette, read a paper on "Bacillary Dysentery."

A committee was appointed to study and recommend for adoption a basic fee schedule.

Wm. A. Meierding, *Secretary.*

AMERICAN PROCTOLOGIC SOCIETY

The thirty-first annual session of the American Proctologic Society will be held at Buffalo, New York, June 22, 23, 24, 1930, with headquarters at the Statler Hotel.

While the society has a membership limited to fifty Fellows and thirty Associates, regular practitioners who are members of the American Medical Association are cordially invited to attend the meeting.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The fifty-second semi-annual meeting of the Southwestern Minnesota Medical Society was held at the Ashton Memorial Hospital, Pipestone, Minnesota, May 6, 1930.

Drs. N. J. Nessa, S. A. Kellar, and C. W. Forsberg, all of Sioux Falls, South Dakota, gave interesting talks.

The following members were elected to membership in the Society: Dr. D. P. Maitland, Jackson, Minnesota; Dr. B. M. Stevenson, Fulda, Minnesota; Dr. A. L. Pertl, Windom, Minnesota; Dr. S. Engh, Jackson, Minnesota; Dr. V. J. Telford, Edgerton, Minnesota, and Dr. C. V. Bateman, Mountain Lake, Minnesota.

E. G. McKeown, M.D., *Secretary-Treasurer.*

WOMAN'S AUXILIARY
Minnesota State Medical Association

ANNUAL MEETING OF A. M. A. AUXILIARY IN DETROIT—JUNE 23-27

Plans for the annual meeting of the National Auxiliary in Detroit, June 23-27, come on apace. The Auxiliary as an organization is occupied only with business affairs, and has nothing whatever to do with any social gatherings except the official Auxiliary luncheon. Members of the Board of Directors are Mrs. William Gerry Morgan, District of Columbia; Mrs. Olin West, Illinois; Mrs. L. T. Harris, Michigan; Mrs. Walter Jackson Freeman, Pennsylvania, and Mrs. Southgate Leigh, Virginia, chairman. Mrs. Basil Loren Connelly is chairman of the Detroit committee for the convention proper, and Mrs. Burt Shurly of the social activities.

The Roof Garden of the Hotel Tuller, next to the Statler, will be headquarters for all Auxiliary business —registration, meetings, etc.—and the Auxiliary luncheon on Tuesday, June 24. There will be no registration fee, but members will buy their own luncheon tickets—$1.50. The registration bureau will be open Monday, Tuesday and Wednesday, June 23, 24, 25, from 9 to 4; Thursday and Friday, June 26, 27, from 9 to 12. Programs, badges, etc., may all be procured here, and invitations, tickets and transportation cards must all be procured here *in advance.*

The meetings are open to every woman attending the convention, and under Mrs. Hoxie's leadership they are bound to be well worth the trip. There will be three morning sessions, Tuesday, Wednesday and Thursday, June 24, 25, 26. The afternoons and evenings are all left free for sightseeing and social activities, for which many plans are in the making. Details have not yet been announced, but they include motor and boat excursions, and visits to some of the handsome private estates in the environs, including that of Mr. Henry Ford. The Detroit Museum of Art is among the best in the United States. No parties have been scheduled during business hours.

No one may represent her state in any capacity whose state dues are not fully paid. The Chairman of the Committee on Credentials and Registration is Mrs. Ledru Otway Geib, 3860 St. Clair Avenue, Detroit.

Only delegates may take an active part on the floor of the convention, but alternates should attend all sessions and hold themselves in readiness to take their delegates' place if necessary. All resolutions must be in writing and signed, and in the hands of the committee 24 hours before the session at which they are to be presented. Mimeographed copies will be distributed as the delegates take their seats. The Chairman of the Committee on Resolutions is Mrs. Augustus S. Kech, 218 Logan Avenue, Altoona, Pa.

The Board of Directors meets Monday, June 23, at 2:30 P. M. All State presidents and presidents-elect are urged to attend.

The business meeting is scheduled for Tuesday, June 24, at 9:30 A. M., at which committee reports and other matters will be presented.

A Workers' Conference will take place Wednesday, June 25, at 10 A. M. State officers and committee chairmen especially are urged to attend. This meeting should prove interesting to all members of the auxiliary.

A post-convention meeting will be held Thursday, June 26, at 9 A. M., for the purpose of planning the work for the ensuing year.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MASSEUR SENTENCED TO TEN TO FORTY YEARS IN PRISON

State *vs.* Harold Martin

On Friday, May 16, Harold Martin, 59 years of age, masseur of Minneapolis, was convicted of manslaughter in the first degree following the death of a young woman from an abortion. On May 17th, the Hon. Judge Dickinson sentenced Martin to a term of ten to forty years at hard labor in the State Prison at Stillwater. Martin's sentence to prison was doubled because of his prior conviction in 1914 on a charge of murder in the second degree. Martin served seven years of the previous sentence and was released from prison.

Immediately following his conviction Martin was served with a notice to appear before the State Board of Medical Examiners and show cause why his license to practice massage should not be revoked. The matter was heard by the Medical Board on Tuesday, May 20. There being no appearance on the part of Martin, his license was summarily revoked.

Martin claimed to have been born in Liverpool, England, and to have been a physician and surgeon in that country. However, he never was licensed in this state as a physician and surgeon but in 1927 he secured a massage license from the former Massage Board.

COROZONE

The Corozone unit is a small portable ozonator which can be operated on the ordinary electric light circuit. Ozone in sufficient concentration to kill bacteria is not suitable for ordinary respiration because of its irritant action. Ozone cannot be used as a substitute for good ventilation in a room any more than deodorants or perfume can be used as a substitute for bathing the body. There has been no sound scientific work brought forward to show that there is any place whatever for ozone in problems of ventilation. (Jour. A. M. A., April 3, 1930, p. 1089).

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a patient, a girl eight years old, who has been sick since April 15, 1930, with fever. During the last week in February, 1930, she had measles with normal convalescence, except that she complained of an earache for about four or five hours one day. Past history: Scarlet fever at three years, complications were cervical adenitis, acute glomerulonephritis with urinary suppression, acute endocarditis of mitral and aortic valves with secondary cardiac hypertrophy and dilation. She was in bed for about six months following scarlet fever and has been underweight and frail since that time. Has bronchitis every winter, especially severe before a tonsillectomy which was done in 1928.

Present illness: On April 15th, her mother thought she had a fever, and on taking it found temperature 102.5. This lasted three or four hours and then went down. It came up the next day a little higher and stayed up a little longer, and continued to do the same up to the present. I saw her first April 21, 1930.

Physical examination revealed old heart lesion; occasional crepitant râle, left lower lobe; palpable spleen. The right ear drum was bulging. Blood vessels along the center were engorged, but there was no tenderness or edema of the mastoid region. There was slight impairment of hearing. Temperature 104.5; pulse 130. I thought from the appearance of the ear drum that it would probably rupture, so I advised waiting a few days. I saw her again April 28th. She still had no complaints other than temperature going up every day. Occasionally had chill before fever and sweating when fever dropped. Temperature would stay up about four hours, and was going to 105.5. I did a von Pirquet, took blood for a Widal, for agglutination against undulant fever—all were ngeative. April 30th, I did a paracentesis. The ear immediately discharged thin watery pus and has been discharging ever since. Discharge is very profuse. Temperature elevation, chills, and sweats have continued as before. Since May 5th, she has been in the hospital. Mastoid area has never been tender or edematous. *X*-ray of chest shows chronic bronchitis; apices are clear. *X*-ray of mastoid shows hazy outline of cells. Leukocyte count varies from 9,000 to 10,000; temperature from 97 to 106.8; pulse 90 to 120. Widal and von Pirquet have been repeated and are negative. Otoscopic examination showed some bulging of posterior wall with pulsation. On one occasion there was a few clumps of pus in the urine, but several specimens since have been negative. There is no tenderness in the kidney region.

What treatment would you follow? Would you advise mastoidectomy or to leave it alone and await further developments?

Answer:—The history and physical findings suggest acute mastoiditis with lateral sinus thrombosis. Mastoidectomy is advised, and if the lateral sinus is involved possible jugular ligation should be done. There is also the possibility of lighting up an old infection of the heart valves and a possible recurrence of the glomerulonephritis. I do not believe it is advisable to wait any longer. An operation should be done at once.

2. *Question.*—Patient is a young man, twenty-four years old, farmer, single, robust in appearance; comes to me complaining of drowsiness and tiredness. He began to notice this along in February of this year. In March felt feverish, but never took his temperature. Has never had any chills. There is a slight headache which gradually grew worse. About three weeks ago had two ulcerated teeth extracted and felt some better for a while, but last ten days has been getting worse and complains of fatigue. Other complaints—nocturia three or four times a night, constipation, poor appetite, fifteen pound weight loss. No particular aches or pains. Father, sixty-one, has been feeling poorly in about the same way and for about the same length of time. Mother living and well. Four brothers and one sister living and well. Under observation his temperature ranges from 99.6 to 104.6, pulse 80 to 108, respirations 20 to 30.

Physical examination showed soft systolic murmur, no glandular enlargement, no areas of tenderness or masses. Today I thought I found a slight enlargement of the spleen. Urine negative except for an occasional granular cast. Hemoglobin 75 per cent, erythrocytes 3,640,000, leukocytes 7,830; differential—polymorphonuclear leukocytes 52, lymphocytes 39, monocytes 9. Blood pressure 94/50. *X*-ray of chest shows calcified lymph nodes, and probably a little more infiltration from hilum out, but this is not definite.

Answer.—The following possibilities should be considered: (1) Undulant fever—please send about 2 to 5 c.c. of blood in a Wassermann test tube to the State Department of Health and mark it "for undulant fever." It is very important to mark the tube. This is a strong possibility because of the number of cases of undulant fever that are present throughout the country. In addition, I would send some blood from the father, who has the same complaint. As a general rule, undulant fever victims feel fairly well, have a high fever, and do not have any special complaints. In addition to testing the blood for undulant fever, the State Department of Health will also make tests for tularemia, typhoid fever, and paratyphoid fever.

(2) Subacute bacterial endocarditis—may be diagnosed by a blood culture and embolic signs in the spleen and kidney. Very often patients suffering with bacterial endocarditis will have a splenic infarct. Hematuria is the other diagnostic sign. Petechia may also be demonstrated in the skin.

(3) Urinary tract infection—pyelitis, pyelocystitis, or perhaps a tuberculosis of the kidney. Examine sediment.

(4) Pulmonary tuberculosis—if there is any sputum, it would be advisable to have it examined for tubercle bacilli.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

MEAD JOHNSON & Co.

Mead's Dextri-Maltose with Vitamin B.

PARKE, DAVIS & Co.

Ampoules of Pitocin 0.5 c.c.

ELI LILLY & Co.

Merthiolate Jelly, Lilly

Merthiolate Ointment, Lilly

E. R. SQUIBB & SONS

Squibb's Dextrose-Vitavose

FREDERICK STEARNS & Co.

Synephrin

Synephrin Solution "A"

Ampoules Synephrin-Procaine, 3 c.c.

Hypodermic Tablets Synephrin-Procaine

The following article has been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1929, p. 481):

G. D. SEARLE & Co.

Stable Solution Dextrose and Sodium Chloride (Searle)

TRUTH ABOUT MEDICINES

Diphtheria Toxin-Antitoxin Mixture 0.1 L. + Nonsensitizing (Sheep).—A diphtheria toxin-antitoxin mixture (New and Non-official Remedies, 1929, p. 360), each c.c. of which constitutes a single dose of diphtheria toxin neutralized with the proper amount of antitoxin produced from sheep. It is marketed in packages of three vials, each containing 1 c.c.; in packages of one vial containing 10 c.c.; in packages of one vial containing 30 c.c.; and in packages of thirty vials, each containing 1 c.c. United States Standard Products Co., Woodworth, Wis.

Tablets Tutocain No. 6.—Each tablet contains tutocain (New and Non-official Remedies, 1929, p. 51) 0.05 Gm. Winthrop Chemical Co., Inc., New York.

Ampoules of Pitocin 0.5 c.c.—Each ampule contains more than 0.5 c.c. of pitocin solution (Jour. A. M. A., July 13, 1929, p. 117). Parke, Davis & Co., Detroit.

Merthiolate Jelly 1:2,000.—It contains merthiolate (Jour. A. M. A., December 7, 1929, p. 1809) 0.05 per cent, eucalyptol 0.016 per cent, eugenol 0.016 per cent in a water-soluble base. Eli Lilly & Co., Indianapolis.

Merthiolate Ointment 1:1,000.—It contains merthiolate (Jour. A. M. A., December 7, 1929, p. 1809) 0.1 per cent in a petrolatum base. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., April 19, 1930, p. 1237.)

Butesin Picrate Eye Ointment.—An ointment containing 1 per cent of butesin picrate (New and Non-official Remedies, 1929, p. 54) in a petrolatum base. Abbott Laboratories, North Chicago.

Pneumococcus Antibody Solution, Types I, II and III Combined-Mulford (New and Non-official Remedies, 1929, p. 346).—This product is also marketed in packages of four 50 c.c. double-ended vials with one complete intravenous outfit. H. K. Mulford Co., Philadelphia.

Ampules Dextrose (d-Glucose) 10 Gm., 20 c.c.—Each ampule contains dextrose (New and Non-official Remedies, 1929, p. 240) 10 Gm., in distilled water, to make 20 c.c. Lakeside Laboratories, Inc., Milwaukee, Wis.

Ampules Sodium Cacodylate 0.243 Gm. (3 3/4 grains), 5 c.c.—Each ampule contains sodium cacodylate (New and Non-official Remedies, 1929, p. 73) 0.243 Gm. (3¾ grains) in 5 c.c. of solution. Lakeside Laboratories, Inc., Milwaukee, Wis. (Jour. A. M. A., March 1, 1930, p. 634.)

Squibb's Dextro-Vivatose.—A mixture of Squibb's vitavose (New and Non-official Remedies, 1929, p. 244), 1 part, and dextrose, 2 parts. E. R. Squibb & Sons, New York. (Jour. A. M. A., March 29, 1930, p. 920.)

FOODS

The following products have been accepted as conforming to the rules of the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association:

Klim Powdered Whole Milk (Merrell-Soule Co.).—It is whole milk from which all but about 2 per cent or less of the normal water has been removed by means of the spraying process of drying milk. It contains: fat, 28.0 per cent; protein, 26.7 per cent; lactose, 38.0 per cent; ash, 5.8 per cent; water, 1.5 per cent. Klim milk is used for supplementary feeding to be used according to a physician's formula.

Borden's Natural Flavor Malted Milk (The Borden Co., New York).—It is a processed mixture of barley malt, wheat flour and whole milk, reduced to powdered form. The product contains: fat, 9.2 per cent; protein, 15.5 per cent; lactose, 13.5 per cent; maltose, 35.6 per cent; dextrin, 20.2 per cent; ash, 3.8 per cent; moisture, 2.2 per cent. It is easily digested.

Mellins' Food (Mellin's Food Co., Boston).—It is a milk modifier. It contains: fat, 0.16; protein, 10.35; maltose, 58.88; dextrins, 20.69; soluble carbohydrates, 79.57; salts, 4.30; water, 5.62. Mellin's Food is a soluble, easily digestible dry extract made from wheat flour, wheat bran, malted barley and potassium bicarbonate.

Mellin's Food Biscuits (Mellin's Food Co., Boston).—They contain a large percentage of Mellin's Food. (Jour. A. M. A., April 12, 1930, p. 1145.)

Peter Pan Bread (P. F. Peterson Baking Co., Omaha).—A thoroughly baked, white bread having a soft velvety texture and sweet flavor.

Clapp's Original Approved Baby Soup and Strained Vegetables (Harold H. Clapp, Inc., Rochester, N. Y.).—Baby Soup: A combination of beef juice and vegetables. Wheatheart Soup: A combination of wheat germ, vegetables and cereals. Strained Vegetables: Spinach, wax beans, carrots, asparagus, peas, beets, prune pulp, apricot pulp and tomatoes. In these products all possible food values are retained and the least amount of water is used in cooking.

Checkr-Redi-Cooked Oats or Checkr Rolled Oats (Ralston Purina Co., St. Louis).—Checkr-Redi Cooked Oats have been precooked to bring out their mellow

flavor and to make them quickly prepared and easily digested.

Minute Gelatin (Minute Tapioca Co., Inc., Orange, Mass.).—Pure granulated gelatin offered in convenient size cartons for household use. (Jour. A. M. A., March 1, 1930, p. 635.)

Borden's Sweet Chocolate Flavor Malted Milk (The Borden Co., New York).—It has the following average composition: fat 6.7%; protein 9.7%; sucrose 47.8%; other carbohydrates (maltose, dextrin, lactose) 31.0%; ash 2.4%; insoluble chocolate solids 0.4%; moisture 2.0%. This product differs from other chocolate malted milks in that the cocoa is cooked.

Quaker Puffed Wheat (The Quaker Oats Co., Chicago).—It is made from whole wheat; 25 per cent is bran. The minerals are retained. Puffed Wheat with whole milk is approximate in energy value to a dish of hot cooked cereal.

Quaker Oats (The Quaker Oats Co., Chicago).—Brands: Quick Quaker Oats; Rolled Quaker Oats; Mother's Oats; Quick Mother's Oats. Quaker Oats provides 50 per cent more protein than wheat, 60 per cent more than wheat flour, more than twice as much as rice; 100 per cent more than cornmeal. It is rich in minerals and Vitamin B.

Instant Postum (Vacuum Cereal Beverage) (Postum Co., Inc., Battle Creek, Mich.).—A beverage made only of whole wheat and bran roasted with a small portion of sugar-cane molasses. It contains no caffeine.

Postum Cereal (Postum Co., Inc., Battle Creek, Mich.).—It is made only of whole wheat and bran roasted with a small portion of sugar-cane molasses. It contains no caffeine.

Sac-a-Rin Brand of Canned Vegetables (Kings County Packing Co., Oakland, Calif.).—Brands: California Tomatoes; California Asparagus; California Spinach. These are vegetables packed without added salt or sugar for dietetic purposes. For use when an intake of carbohydrate—particularly sugar—is to be restricted.

Sanka Coffee (Sanka Coffee Corporation, Brooklyn and Los Angeles).—A blend of South American coffee with Mocha and Java. The caffeine is removed by a process which removes 97 per cent or more of the caffeine originally present in the bean (based on 1.1 per cent of caffeine). It may be used when other coffee has been forbidden.

Milk Packed Coconut (Franklin Baker) (Franklin Baker Co., Hoboken, N. J.).—The shredded coconut is packed in cans without the addition of sugar, the can being filled with coconut milk.

Franklin Baker Premium Coconut (Franklin Baker Co., Hoboken, N. J.).—The shredded coconut is mixed with added sugar and 5 per cent glycerin and passed through driers.

Southern Style Coconut (Franklin Baker) (Franklin Baker Co., Hoboken, N. J.).—Coconut meat is passed through an automatic shredding machine, after which the added sugar is mixed with the coconut meat, the resultant product being passed through driers. The product is packed in cans in an atmosphere of carbon dioxide.

Hellman's Mayonnaise (Richard Hellman, Inc., Long Island City, N. Y.).—It is made from a blend of edible vegetable oils, vinegar, egg yolk, spices and condiments beaten to a stable emulsion.

Minute Tapioca (Minute Tapioca Co., Inc., Orange, Mass.).—It is made from tapioca flour. The flour is bolted, mixed with water, steam cooked, granulated and dried.

Association of Hawaiian Pineapple Canners.—On the basis of an average of representative samples of Hawaiian pineapples there is obtained a value of 88 calories per hundred grams of canned pineapple. There are better sources of a single vitamin, but as an all around source of vitamins the pineapple takes unusually high rank. Canned pineapple is an article of diet of substantial food value. (Jour. A. M. A., March 8, 1930, p. 716.)

THE PELLAGRA PREVENTIVE ACTION OF CANNED SALMON

In connection with studies relating to the pellagra preventive properties of various food substances the United States Public Health Service has recently announced that canned salmon (Alaska chum) contains the pellagra preventive factor. By reason of its potency in preventing pellagra and its availability in the preserved state, salmon may be considered a fair substitute for meat in the area of pellagra endemicity where meat is not readily available. The demonstration of the pellagra preventive value of canned salmon furnished further evidence of the soundness of the working hypothesis that black tongue in dogs is the analogue of pellagra in man.

CITRIN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Citrin is marketed by the Table Rock Laboratories in the form of capsules claimed to contain "50 mgm. cucurbocitrin," the latter being "a non-toxic glucosid-saponin processed from the seed of the watermelon (Cucurbita Citrullus)." In the information submitted to the Council, Citrin is stated to be "the crude extract" obtained from the watermelon seed. The available evidence does not indicate that the product is a pure glucoside. Citrin is stated to be "for the treatment of hypotensive cardio-vascular disease" and is advertised as "The new therapy for vascular hypertension." The Council reviews the available evidence for the usefulness of Citrin and explains that the question at issue seems to be whether the observed lowering of blood pressure by drugs is of any great clinical value, and, when this does occur, to what extent it is due to the drug and to what extent to other factors. Altogether, the Council concludes that the clinical evidence does not establish the therapeutic usefulness of Citrin; hence, the Council declared Citrin unacceptable for New and Non-official Remedies. (Jour. A. M. A., April 5, 1930, p. 1067.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 9, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 9, 1930. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. Emil S. Geist. There were 52 members present.

Minutes of the March meeting were read and approved; also the minutes of the Executive Committee meeting of March 26th.

Dr. C. D. Freeman read the following memorial to Dr. Paul B. Cook:

Dr. Paul B. Cook, a member of this Academy since 1911, died February 9, 1930, at Miami Beach, Florida, where he had gone to recuperate his health.

He had practiced in St. Paul since his graduation from the University of Minnesota in 1900. He was born in Rochester, Minnesota, the son of George Clinton and Elizabeth Burns Cook. He made his home with his sister, Mrs. F. B. Kellogg, in St. Paul, not having been married.

Dr. Cook was a member of Ramsey County Medical Society, Minnesota Academy of Medicine, Twin City Urological Society, Minnesota Dermatological Society, and the American Urological Association.

Until 1907 he practiced general medicine, when he went to Vienna for a year and did postgraduate work in dermatology and urology, to which specialties he limited his work until his death.

He enlisted early in the last war and after spending several months at Camp Riley and Camp Jackson he was sent to France with the rank of Major in the Medical Corps, where he remained until after the Armistice.

During the last few years of his life Dr. Cook traveled very extensively. He visited South America, Hawaii, took a world cruise, and last year took an extended tour around Africa. Shortly before his last illness he was planning another trip and stated that his only trouble was to find a new place to go.

Dr. Cook is survived by two sisters, Mrs. F. B. Kellogg and Mrs. F. J. Ottis of St. Paul, and a brother, George Cook of Rochester, Minnesota.

Dr. Cook's fine qualities won for him the affection and loyalty of those who knew him well. He was well known by all medical men in this vicinity. As a tribute to him it may be said with no fear of contradiction that he possessed two qualities necessary to every physician: he was honest, he was ethical.

The Committee: S. E. Sweitzer,
F. E. B. Foley,
C. D. Freeman, Chairman.

Dr. A. S. Hamilton read the following memorial to Dr. C. Eugene Riggs:

Dr. C. Eugene Riggs, physician and scholar, educator and original investigator, was born in West Unity, Ohio, in 1853, and died in St. Paul, April 3, 1930. He was descended from an old Maryland family and was attracted to St. Paul, as many other physicians before him, partly by the hope that the vaunted Minnesota climate might heal a suspected pulmonary weakness.

His early education was obtained in the public schools of Ohio, and he later attended Ohio Wesleyan University, where he received the degree of A.B. in 1877, and that of M.A. in 1880. At one time in that period of his life he expected to enter the ministry. He later turned to medicine and his first training was received in the office of his brother, Dr. J. U. Riggs, of Bryan, Ohio. He subsequently had one year in the Medical College at Nashville, Tenn., and was graduated in 1880 at the College of Physicians and Surgeons in Baltimore, Md. After one year as intern at the Women's Hospital, in Baltimore, he came to St. Paul in the spring of 1881 and engaged in the general practice of medicine. Apparently, at this time he had no special interest in diseases of the nervous system and, when, almost immediately on his arrival, he was asked to present a course of lectures on Materia Medica in the St. Paul Medical College, he accepted. Later he was offered the chair of Nervous and Mental Diseases in the same institution, which offer he also accepted, becoming thus the pioneer in Minnesota in the private practice of neurology and psychiatry. When the medical department of the University of Minnesota was established, he was made Professor of Nervous and Mental Diseases and in 1908 became Director of the Department as well as professor. Preparatory to the reorganization, January 15, 1913, he resigned and in June of that year was made Emeritus Professor of Nervous and Mental Diseases, which position he held until his death. Dr. Riggs was an excellent teacher and an inspiring spirit in all his associations with his students and fellow practitioners and to his patients he imparted confidence and courage. He had an unusual knowledge of current literature in his own field and almost to the last day of his life he read his journals, clipped from them the articles which seemed to him especially valuable and put them away in his filing system. Notwithstanding this familiarity with neurologic and psychiatric literature, he once told me that during his years of active teaching he never delivered a lecture to the students without spending the evening preceding in review of the subject matter. But his interests were not limited entirely to clinical fields and on his return from a trip abroad he brought back the equipment for a neuropathological laboratory, the first private neuropathological laboratory in the state; and in this laboratory Dr. L. B. Wilson worked out the histology of Dr. Riggs' case of subacute combined degeneration with pernicious anemia—the first reported in the state and the third reported in this country.

Throughout a long and active career in the practice of medicine, covering forty-nine years, he was a leader in all movements having to do with his specialty. For ten years preceding the establishment of the State Board of Control, Dr. Riggs was Chairman of the State Lunacy Commission. On one of his trips abroad, he was authorized by Governor Merriam to investigate

the insane hospitals of Europe for the purpose of reproducing in Minnesota whatever was of value in European methods of care for the insane. He also interested himself actively in the matter of providing detention wards in our larger cities, in the need of special care for the criminal insane and in the imperative necessity for a voluntary commitment law.

Dr. Riggs was a member of the American Neurological Association, the American Psychiatric Association, the American Medical Association, the Ramsey County Medical Society and the Central Neuropsychiatric Association. He was one of the founders of the Minnesota Academy of Medicine and a past-president of the Academy, and a founder and first president of the Minnesota Neurological Society. He was at one time chairman of the section of Nervous and Mental Diseases of the A. M. A., and was president at one time of the Minnesota State Medical Society.

He was also a member of the Society of Colonial Wars and of the Sons of the Revolution, of which he had been president, and of the Minnesota Club.

Dr. Riggs was a member of the Plymouth Congregational Church of Minneapolis, Past Master of Summit Lodge, a member of Osman Temple and Paladin Commandery, as well as a 32nd Degree Mason.

Dr. Riggs was a very religious man, as one incident of his early career shows. Though he had been offered a position as Chief of the Department of Neurology and Psychiatry in the St. Paul Medical College, the school ceased to exist before he could give his first course of lectures and was merged with the Minneapolis College Hospital in Minneapolis. The meeting for the final settlement of the details of the union and the allocation of titles was held on a Sunday afternoon and Dr. Riggs announced that rather than attend the meeting on Sunday he would renounce his claim for a position on the faculty and he kept his word, but, nevertheless, was given the professorship in his specialty.

Despite his large private practice and his duties as a teacher, Dr. Riggs found time to be a good citizen and to contribute to medical literature some 80 or 90 papers dealing largely with the various phases of neurology and psychiatry. The first article of which I can find any record was published in the Southern Clinic of Richmond, Va., in 1881, under the title "Atresia of the Female Genital Tract," obviously at a time when he had no thought of his ultimate relation to psychiatry. The last article I have found is entitled "Address of Greeting to the American Psychiatric Association" at Minneapolis, June, 1928, published in the American Journal of Psychiatry 1928-1929.

In the intervening period of forty-nine years Dr. Riggs discussed a very wide range of neurologic and psychiatric topics, and though it is hardly proper to detail them here, I may refer specially to two historical articles which are of distinct value in understanding the early medical situation in Minnesota. "Minnesota Medicine in the Making" was published in the State Journal in October, 1921, and the "Reminiscences of a Neurologist" in the same journal of January, 1928.

Perhaps the high point of Dr. Riggs' professional career was reached the night of April 26, 1928, when he was the guest of honor at a dinner tendered him at the Minnesota Club by a group of professional friends.

Of Dr. Riggs' personal character it is less easy to write. To the public, he was the gentleman and the aristocrat. Severe in his principles, he lived his life according to his creed, never deviating from it. He was not one with whom it was easy to make friends, but his friendship, once given, was loyally maintained. One who knew him well has assured me that he never once heard Dr. Riggs utter a profane word, hardly even a slang phrase. As a past-master in the handling of patients, he was well known, but of his kindness, his consideration and his charity to patients, his immediate associates alone were cognizant.

His home life was ideal. On September 11, 1884, he married Mabel Elizabeth Pratt at Bryan, Ohio, and in his wife, to a very unusual degree, he found a companion who shared his ideals, helped him in his labors and enabled him to devote all his energies to the attainment of the very best in his professional life. To the limited friends who were privileged to enjoy it, the hospitality of this household is a happy memory not easily forgotten.

The Committee: W. A. Jones,
E. M. Hammes,
A. S. Hamilton, Chairman.

The scientific program of the evening consisted of two theses.

Dr. E. V. Goltz (St. Paul) read his thesis entitled "Primary Carcinoma of the Lungs and Bronchi."

DISCUSSION

Dr. C. E. Connor (St. Paul): I think that none of us sees enough of this type of case to have a very wide experience; I am sure I haven't. Carcinoma of the lung can modify the normal bronchoscopic picture in either one of two ways: 1. By bronchial pressure with intact mucosa, in which case the bronchoscope is apt to show a stenosis or, if extreme, a complete occlusion. The latter would be rather unusual. 2. By the appearance in the air-way of the tumor itself. These tumors may assume either one of two different types, the fungating, flat, bleeding tumors which suggest malignancy and whose origin is at times determined with difficulty, or the pedunculated papillomatous structure which does not at first suggest carcinoma. The latter, however, is not the type which would give the characteristic clinical picture that Dr. Goltz has described. If the tumor has invaded the air-way, the condition of the bronchial tree will depend a good deal on the size of the tumor. If the tumor is small there will be very little change other than the collection of sanguineous fluid. If the tumor has reached a stage where occlusion is marked, either atelectasis or bronchiectasis may be found.

The bronchoscope does offer a distinct aid in diagnosis and every suspicious case should be bronchoscoped. The results are sometimes surprising. Biopsy

is also important. In the case of the pedunculated papillomatous tumor that is occasionally reported, permanent cure may be obtained, lasting over 5 years. Therapy in the commoner clinical type with various lung changes consists primarily of measures for temporary relief, usually aspiration, which will give the patient considerable relief. Another measure, but one which I have never used, is the implantation of seeds. Deep therapy may be tried, but usually avails little.

Dr. Thomas S. Roberts (Minneapolis): Being called upon, I will speak but I cannot add anything material to this discussion since in some 40 years of practice I have seen only a few cases of carcinoma of the lung and they were not primary in the lung. During a year spent as intern in one of the largest hospitals in Philadelphia there never was a case of primary carcinoma of the lung in the very large number of autopsies that were done there, so far as I can recall. A very considerable number of these were presided over by Dr. William Osler, who never failed to discover and correctly interpret whatever was present.

A case of carcinoma of the lung, though not primary in the lung, seen recently, may be of interest in some of its aspects. A man 66 years of age seemed to be in the best of health until he became greatly depressed mentally (for reasons that were quite sufficient it seemed), when there began a physical decline which was attributed to the state of mind rather than to any disease. He was examined by several physicians, who found nothing definite. After a few weeks there developed a condition which Dr. Sam Sweitzer agreed was probably pellagra of a secondary type. The patient had been eating irregularly and insufficiently, substituting for food a certain amount of alcohol and worrying incessantly, which suggested the possibility of pellagra as an explanation of the unusual skin lesions that appeared on feet, hands and head. Later he developed a moderate cough, some difficulty in swallowing, lost flesh markedly, and still his condition was considered to be largely mental. About this time we went to Rochester and he went through the Clinic, was *x*-rayed, etc., and nothing very definite was discovered, and he came away with the opinion that if he would take a little different view of things he would probably be all right. He did actually gain in weight and made one or two trips to Chicago on business, which looked as though there was not very much the matter with him. Then he began having some pain and distress in the chest and epigastrium. We dined together several times and it was noticed that at the beginning of a meal he seemed to have a little hesitancy in swallowing, with some cough, but then went on and ate his meal without apparent difficulty. As time went on he began to slip back again, had more distress generally, became partially bedridden, and had one or two attacks of sharp pain in the *left* chest. The physical signs were still indefinite. Again we went to Rochester, but before going had a complete set of *x*-rays made here of the chest and abdomen; these showed nothing in the chest but there was apparently some enlargement of the spleen. Another set of pictures was made at the Mayo Clinic and for the first time there was a slight shadow in the *right* lung. There was some difference of opinion as to what this indicated—between an interlobar empyema and a malignant growth. (It is only fair to say that a proposal to make a bronchoscopic examination was declined as the patient's condition at this time was such as to make it seem hardly worth while. It would no doubt have cleared up the uncertainty.) From this time on he was confined to bed mostly, developed a severe cough with offensive sputum, failed rapidly, and died without a positive diagnosis. Dr. E. T. Bell performed an autopsy and found an extensive carcinomatous involvement of the right bronchus, a large abscess in the upper lobe of the right lung, and the esophagus surrounded and partly destroyed by a carcinomatous mass where it came in contact with the involved bronchus. At this point it was densely thickened and indurated, and denuded of the mucous membrane. Through this extensively diseased esophagus, stomach tubes had been passed several times without causing any noticeable distress to the patient, strange as it may seem. It was Dr. Bell's opinion that the carcinoma was primary in the esophagus and secondary in the lung. Other autopsy findings were an enormously enlarged spleen, weighing 1,000 grams, the lower half being the seat of a large metastatic carcinoma measuring 10×12 cm., the central portion necrotic; an open ulcer, 1.2 cm. in diameter, immediately on the gastric side of the pyloric ring; numerous diverticula of the sigmoid, one at least showing acute inflammation; and a moderate grade of cholecystitis with a single small gallstone—certainly a formidable pathological array, and yet this man had comparatively little physical disability until the last few weeks of his life. It was not such a great while before his death that he went to Chicago alone and took care of considerable important business. He must have had this devastating growth developing during the time that we were accusing him of being simply despondent and downhearted. Toward the last, when the mental depression waned almost entirely, about his only complaint was a distress in the region of the stomach and lower chest and he was wont to say, "If I could only get rid of this discomfort I would feel all right."

Dr. C. B. Wright (Minneapolis): How long was the duration of the condition in this man?

Dr. Roberts: I can't say exactly, the onset was so indefinite. He was apparently well until one day something happened to disturb his business relations that depressed him greatly. He went to his summer home in northern Minnesota and sat on the porch most of the time brooding. Early that fall he showed signs of failing, but was not considered seriously sick. He died the following July. Not one of the *x*-rays showed anything suggestive until the last set, about 8 weeks before his death. I imagine he may have had some difficulty in swallowing and perhaps some discomfort that first summer, but he was not a man to complain.

It all goes to show how mortally stricken a man may be and yet how difficult it may be sometimes to find out what is the matter.

Dr. E. K. Geer (St. Paul): I have seen five of these

primary lung carcinomas in the last ten years. The last one is interesting enough to report briefly. A man in his late forties was admitted to Pokegama Sanatorium a year ago with an old bilateral upper lobe tuberculosis. In 1914 he had had an active tuberculosis with positive sputum, and the loss of weight, cough and so forth of which he complained before coming to the sanatorium in 1929 was thought to be a recurrence of his old lung lesion. On the usual sanatorium régime he gained 40 pounds but did not lose his cough. His *x*-ray films on admission showed the old upper lobe tuberculosis and also a shadow at the right root which could have been interpreted as a large gland. About two months ago he complained of dyspnea and on examination an atelectasis of his right lower lobe was found with marked displacement of his heart and mediastinum to the right. Bronchoscopy done by Dr. Greth Gardiner revealed an intrabronchial growth in the right lower bronchus and a section of this growth showed it to be cancer. The lack of characteristic cough, the absence of chest pain, and the suddenness with which it expressed itself clinically were certainly atypical. The other cases I have seen conformed very well to the chief points brought out so clearly by Dr. Goltz.

Inasmuch as physical examination is often disappointing and the *x*-rays films apt to be misleading because so many are reported as "probably inflammatory," it seems to me that from the diagnostic side we will spot this form of cancer much more frequently if we resort to bronchoscopy more often in obscure lesions.

The treatment of primary cancers of the lung has been hopeless in my experience. Deep *x*-ray therapy may prolong life a little but it certainly does not cure.

Dr. Herbert Davis (St. Paul): In how many of those cases did you find tuberculosis?

Dr. Geer: The case I have just mentioned was the only one in which clinically demonstrable tuberculosis in the lung was associated with primary lung cancer.

Dr. S. Marx White (Minneapolis): I wish to call attention to certain sources of error in diagnosis common when carcinoma is developing in the lung. I have been in a position to see a fair number of cases during many years' service at the University Hospital in our work in the Clinic. A case occurring in a well-known internist in Cleveland about two years ago illustrates one of the sources of difficulty. This physician, whose name would be familiar to everyone here, had, with an insidious onset, a suppurative process in the left interlobar fissure. This process required drainage but, because it covered up the primary process, the diagnosis of carcinoma could not be made at first but subsequent developments made that diagnosis clear. I have seen such suppurative interlobar processes in carcinoma and they are a serious element of confusion.

A more common cause for difficulty in diagnosis is in the differentiation from pulmonary tuberculosis, particularly when the carcinoma develops in an upper lobe; the *x*-ray shadow may be that of a pyramid of greater density than normal, the apex toward the hilus of the lung. With the tendency on the part of the roentgenologist to report such shadows as tuberculosis, even in the absence of such phenomena as cavitation or other processes which are highly significant of a destructive process like tuberculosis, the roentgen diagnosis is given greater value than it deserves and the clinician is likely to accept the diagnosis as final when it should be taken only as a part of the whole picture.

A third difficulty lies in the fact that with carcinoma of the lower lobe pleural effusion very frequently occurs. The effusion masks the infiltrative processes in the lung and there is nothing in the *x*-ray picture, therefore, to suggest an intrapulmonary process. The frequent occurrence of blood in such effusions is suggestive and often helpful in calling to mind the possibility of carcinoma. The fact that pain is also usually a predominant symptom in carcinoma adds another suggestive point.

Dr. Goltz's paper is a very helpful contribution to a subject of great importance and it is clear that carcinoma of the lung, while it has certain features highly suggestive from the clinical standpoint, is liable to simulate a number of conditions, and unless we think of it as a possibility in all cases, especially with people in the cancer age, we can easily miss the diagnosis.

Dr. C. N. Spratt (Minneapolis): In an abstract of an article on tobacco and tobacco-smoke as a factor in cancer, in the Journal of the A. M. A. for March 29, 1930, Lickint reviews over 4,000 cases of cancer of the bronchi and lungs from the literature. He finds this five times more common in men than in women. He believes "that this is to be explained in part by the great increase in cigaret smoking, with its attendant inhalation. Not only smokers but non-smokers are exposed to this danger in smoke-filled rooms. Because of the finer state of division of the particles in tobacco smoke, they have a much greater penetrating power than have particles of dust. In the case of tobacco smoke, the maximum amount of irritation is produced because, in addition to the mechanical irritation (particles of carbon), there is also a chemical (tarlike combustible products) and a thermal (current of heated air) irritation."

According to Dr. Henry W. Cook, in an address delivered at a convention of life insurance presidents in December, 1929, the expectance of life has not increased except in the first two years, and no appreciable gain is shown after the age of 50, "and a very marked loss is shown in several very important diseases such as heart disease—now the largest single mortality factor—in cancer, in diabetes, and in death from automobile accidents. In other words, while a baby born today has an increase in life expectancy of 17 years, an adult of 50 or over has no increased expectancy in comparison with 50 years ago, and probably even in comparison with 2,500 years ago, in the days of Pericles."

Dr. Bloodgood has called attention to the fact that cancer of the lip is more common in men than in women, and has brought up the question of its increased frequency in the latter as smoking becomes more common among them.

Dr. A. R. Hall (St. Paul): One of the interesting things brought out by the essayist is the increase of carcinoma of the lung. The essayist states that this is a real increase as is shown by autopsy statistics. Au-

topsies are probably not much better done today than they were 25 years ago; what I mean is that carcinoma of the lung would not have been much more likely to have been missed in an autopsy 25 years ago than it is today, and yet statistics from different countries of the world show that, whereas the primary seat of all carcinomas 25 years ago was found to be in the lung in about 1 or 2 per cent of cases, today in all carcinomas the primary seat is found in the lung in about two to three times this percentage. The statistics from the different hospitals in different countries are fairly uniform in this increase. It is interesting to speculate as to what the cause of this increase may be. It must be some world-wide cause. As Dr. Goltz has stated, many different things have been considered that might be a causative factor. The one lung irritant which has been suggested and which would seem to fill the requirement of being world-wide is influenza.

As to diagnosis, the most important thing is that we do not forget that there is such a thing as carcinoma of the lung. It seems to me that pain is more often present in carcinoma of the lung than it is in other obscure lung conditions.

In the way of treatment, deep *x*-ray therapy, while it does not cure, does seem to slow up the process.

Dr. L. C. Bacon (St. Paul): My excuse for prolonging the discussion is that this thesis is a timely and valuable one and is entitled to free discussion. The matter of treatment has not been touched upon. At the present time deep roentgen ray therapy is the only method of treatment which gives promise of possible benefit and even with this we are not hopeful. I have come in contact with two casces of lung carcinoma and the result in one of them indicates that deep therapy should be resorted to vigorously.

The first was a woman of 58 years, slender and small, with a carcinoma of the right breast which was removed by radical operation. She returned in a few months with a metastasis involving the right lung, lower and middle lobes. Deep roentgen ray treatment was vigorous and after a stormy period of about three months, during which she expectorated quantities of pus and fibrous tissue, she regained a fair degree of health and lived three years, finally dying from an influenza. Autopsy disclosed complete destruction of the right lung with collapsed thorax completely filled by the remaining thoracic structures. No carcinomatous tissue could be found.

The second case, a large stout woman, 62 years of age, had been in the University Hospital with a diagnosis of carcinoma of the right lung. She had been treated with *x*-ray until she had refused further treatment and returned home. I came into the case only a few days before her death. Autopsy disclosed complete destruction of the right lung and metastases in the liver and left kidney confirmed the diagnosis. Pleuritic fluid was present and the chest wall had not collapsed. She gave a history of repeated drainage of the pleuritic fluid and I drained it once during my charge. She apparently died from exhaustion.

One case living in comfort for three years should admonish us to give these very hopeless cases the possible benefit of *x*-ray.

Dr. Goltz (in closing): I have nothing more to add, but wish to thank the members for the discussion of my paper. I think the important thing to gather from this paper and from the discussions is that one should bear this condition in mind in all obscure chest conditions.

Dr. Emil C. Robitshek (Minneapolis) read his thesis entitled "Acute Perforated Peptic Ulcer."

DISCUSSION

Dr. E. M. Jones (St. Paul): The hour is late but I have some interesting plates I wish to show. The patient, a young man 21 years of age, was admitted to the Ancker Hospital at 8:30 a. m. March 22, 1930. He states that the night before admission he became nauseated and vomited. He retired but was awakened at 4 a. m. by a violent pain in his upper abdomen. He took some soda and the pain became worse. A doctor was called and he was sent to the hospital. On admission he was seen by Dr. Colvin. The man was having severe pain in the upper abdomen. The abdomen was rigid but not the so-called board-like abdomen. Temperature 98°, pulse 80, leukocytes 10,000. The most probable diagnosis was cholecystic disease or perforated ulcer. An hour after admission the picture had entirely changed. He was having no pain and only a slight muscular rigidity in the upper right quadrant of the abdomen. It was decided to treat him expectantly. An *x*-ray plate of the abdomen was ordered and it showed air between the liver and diaphragm. I saw the man again in the afternoon and his condition was the same, with the exception of a temperature rise to 101°. In view of the *x*-ray findings, there was no question as to the diagnosis of a perforated viscus. Five per cent of perforated ulcers are sealed locally and do not develop general abdominal symptoms. Another picture was taken and the air bubble was again demonstrated above the liver. In spite of the patient's good condition, but because of the *x*-ray findings I finally advised operation, but the patient would not consent. Later in the evening he was again seen and his condition was so satisfactory that I decided to continue the expectant treatment.

Cases of perforated ulcer often show apparent improvement after a few hours but then the symptoms of general peritonitis begin to develop and this of course is the reason for early operation. This patient, however, was continually improving and nothing developed pointing to a general peritoneal involvement and we felt these symptoms would have developed by evening as it was 14 hours after the onset.

On the seventh day a picture was taken showing that the air had disappeared, and on the ninth day some barium was given and a duodenal ulcer was demonstrated. I am not advocating the non-surgical treatment of these cases but I do not believe any one watching this man would have operated upon him before we had these *x*-ray pictures.

I think a case like this impresses us with the fact that we must carefully evaluate our clinical symptoms.

Dr. Alex R. Colvin (St. Paul): First of all I would

like to congratulate the essayist on his paper. It is very valuable because of the comprehensive and yet concise statement of the views of those who have large experience in the subject just presented by Dr. Robitshek.

Regarding the case reported by Dr. Jones, I saw this man when he first entered the hospital and the question then seemed not "has he a perforated ulcer?" but "has he a perforating one?" The patient said he had had very severe pain, but at the time of examination he had very little. He had some rigidity but not a board-like rigidity. Whether or not he should have been operated on may be a debatable question. I do not think it would have been a mistake to operate. Certainly the free air above the liver seemed a positive indication, but then clinically he was getting well.

Regarding the number of times an ulcer may perforate, I operated twice in one year for perforation of the same ulcer. At the first operation 10 hours after perforation a simple closure was done; at the second perforation about a year later a suture and gastroenterostomy was done 6 hours after perforation. He still has some residual symptoms.

Regarding the time that has elapsed after perforation and recovery still be possible, fifteen years ago I saw a young man 36 hours after perforation with all of the symptoms of apparently fatal peritonitis. It seemed hopeless to resort to surgery; this was, however, done, with only closure of the perforation. On opening the peritoneal cavity there was a regular gush of air and fluid. Drains were used but with practically no drainage. He has remained free from symptoms since. So that the result in Dr. Jones' case can be understood; the perforation became sealed off and the peritoneum took care of the infection just as it did in my case of 36 hours' perforation with much more extravasated material still to be taken care of after the perforation was closed by operation.

The diagnosis of an acute perforation is usually obvious. I recall one case where, after a midnight examination, the night supervisor, an experienced Sister, wishing to know what action to take, remarked, "A very sick man, doctor?" "Yes." "An ulcer?" "Yes." "Perforation?" "Yes." "Operation?" "Yes." The general behavior, combined with the board-like rigidity were quite familiar to her. In Dr. Jones' case the picture was not at all so striking and doubt might well be entertained; the radiograph was of striking assistance.

In regard to the incidence of ulcer in Scotland. There are two things that made Scotland famous—whisky and the Bible. Whisky has been given as one of the causes of ulcer. I am not sure whether the reason the Scotch have more ulcers perforate is due to whisky or to economy in the employment of medical assistance.

Dr. C. B. Wright (Minneapolis): Acute perforated peptic ulcer is a surgical condition and should have surgical consideration as quickly as possible. Unfortunately, however, these cases are more often first seen by men with little experience either in the diagnosis or treatment. The reason for this is that perforated ulcers are rare. I have repeatedly heard men in general practice for many years say they have never seen one and it is exceptional to find men, outside of large emergency hospitals, who have seen many of these cases. Forty-three cases at the Minneapolis General Hospital over a period of 10 years and operated on by various surgeons is not a large group when one considers that the Minneapolis General is one of the largest emergency hospitals in the Northwest.

I have seen 9 cases in 27 years of practice. The first was the rarer type of perforated ulcer; that is, a large perforation on the anterior wall. This patient was a young, healthy servant girl without previous symptoms of ulcer, who, after eating a hearty breakfast, collapsed on the stairs and had to be carried to bed. I saw her almost immediately and found her in shock; by that I mean pale, cold perspiration, with a small rapid pulse, and complaining of violent pains in her right lower quadrant. She had vomited, but had not vomited blood. She had dullness in both flanks, generalized abdominal pains with marked rigidity and I felt that she might have a ruptured extra-uterine. She was operated in 2 hours. A large meal consisting of meat, potatoes and bread, was found in her abdominal cavity and a perforation in the anterior wall of her stomach the size of a dollar. Sewing up the opening with a purse-string suture and reinforcing it with mattress-sutures, washing her breakfast out of her abdominal cavity with salt solution was followed by recovery. Her convalescence was complicated by infection of the abdominal wall, right-sided pneumonia, and phlebitis. I saw her 25 years later; she has never had any stomach trouble since and nothing could be found by fluoroscopic examination.

There were two other cases of stomach perforation, one a slow perforating ulcer on the anterior curvature, which was readily diagnosed but refused operation and died a few days later at home of a general peritonitis. A third case was in a young woman where the ulcer perforated into the lesser peritoneum and was cured by draining a large abscess some time later.

I have seen 6 duodenal ulcer perforations. One of these cases had been treated by Osler in 1903 for a dilated stomach; later by Sippy. He was finally operated on by Theodor Bratrud for a sudden perforation, with apparently complete recovery, but died 3 years later of a gastric hemorrhage. Two other cases were not seen until 16 hours after perforation had occurred; both had fairly large perforations and died of general peritonitis after the operation. Another case recovered following an operation for perforation of the duodenum by simply closing the ulcer. He later had several attacks of hemorrhage and died 6 years after the operation in a convulsion. This patient refused hospitalization until the very last, after a long period of vomiting, and died from what apparently was gastric tetany. At autopsy he showed a tremendously dilated stomach, apparently without obstruction because one could easily put two fingers through the pylorus. Two others are living, one 10 and one 20 years after the operation, both having had recurring attacks of ulcer trouble. I have never seen a case of ulcer perforate under any kind of proper medical management. However, cases

have been observed by others. It must be a very infrequent happening.

A previous history of ulcer does not helps us, as the history is difficult to obtain and statistics will show that only about 50 per cent of these cases have had a previous history of ulcer.

Accuracy in the recognition of a surgical abdomen can, in the last analysis, only be determined by the care in the examination of the abdomen and the amount of experience of the examiner. There should be no delay in an attempt to make a refined laboratory diagnosis in these emergency cases and the method of treatment should be determined by the conditions which are present.

My own experience leads me to believe that cases of chronic ulcer in which there has been hemorrhage, penetration, or perforation, should be kept under observation and treated for long periods of time; the longer the better, and by treatment I do not mean milk and powders alone. More important are general hygienic measures such as careful living with plenty of rest and a well-balanced bland diet which contains sufficient vitamins.

Dr. J. T. Christison (St. Paul): It is not my intention to discuss so valuable a surgical paper, but I would like to call the attention of the Academy to the fact that perforating ulcers occur in children not infrequently. I have seen three of them. One was sent into the hospital with a diagnosis of acute appendicitis, another of intussusception, and another of pneumonia. Death occurred in all three, and autopsies were had. Two of them had a perforated ulcer on the posterior wall of the stomach at the pyloric end, and the other had a perforation on the anterior wall about the middle of the stomach.

We must not lose sight of the fact that even in very young babies ulcers do occasionally develop. One of these babies was 9 months, one 11 months, and the other 14 months.

Dr. Robitshek (in closing): I have nothing to add, but wish to thank the members for the very kind reception they have accorded my effort and to thank them as well for their discussions.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

EPHEDROL WITH ETHYLMORPHINE HYDROCHLORIDE (LILLY) NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that this is a shotgun cough mixture, relying on an opiate for its effect, and on the vogue of ephedrine for sales-appeal. The Council declared Ephedrol with Ethylmorphine Hydrochloride unacceptable for New and Non-official Remedies because it is an unscientific mixture marketed under an unacceptable proprietary name with unwarranted therapeutic claims. (Jour. A. M. A., March 1, 1930, p. 634.)

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

Stated meeting held March 6, 1930
The President, Dr. S. R. Maxeiner, Presiding.

The meeting was held at the Minneapolis General Hospital and was devoted to clinical case reports presented in the following order:

1. Case reports by Dr. E. A. Regnier.
2. Case reports by Dr. A. A. Zierold.
3. Case reports by Dr. O. J. Campbell.
4. Case reports by Dr. T. H. Sweetser.
5. Remarks by Dr. A. R. Colvin.
6. Remarks by Dr. R. C. Webb.
7. Remarks by Dr. H. B. Sweetser.

Dr. E. A. Regnier: I wish to first present two cases of intracapsular fractures in the neck of the femur. I present these cases, not because of any unusual pathology, but to bring out a few important points in the treatment of this type of fracture.

Case 1.—Female, aged 44, came to the hospital for treatment last August, complaining of pain in the hip, following a fall. Previous history unimportant. (Series of *x*-ray plates shown.) This is a transverse intracapsular fracture of the neck of the femur. Treatment—double plaster spica. You can see from these plates that the anatomical position is good. There is a maximum amount of internal rotation and abduction, which is all-important in this type of fracture. The pictures also show a severe degree of bony absorption, resulting from prolonged encasement in plaster. The plaster in this case was left on for fourteen weeks. Subsequently the patient received physiotherapy, and is now going to be equipped with walking calipers, which we recommend for all of these cases.

Case 2.—This case is practically identical with the previous one, but the treatment was slightly different. The patient was put up in a Thomas Splint in abduction, and as you see from the *x*-ray plate the position was anatomically nearly perfect. Two months later the patient complained of pain in the hip joint. *X*-ray was taken and showed complete displacement of the fracture. This had taken place and the cause was unknown. The patient was then put in a plaster spica, and bony union was obtained after sixteen weeks. She now has excellent functional result and very little shortening. I present this case merely to point out that the treatment of hip fractures is fraught with pitfalls and accidents, and to show the many possibilities that may interfere, and militate against good end-results. We are pretty well committed to the Whitman method of treatment of hip fractures, for the following reasons: it assures against displacement once the cast is applied; it will maintain the fragments in whatever position they may have been reduced; it will assure bony union in a greater percentage of cases than any other conservative method of treatment; it is the only method that can maintain the proper degree of internal rotation, which is necessary in this type of case. It is

not ideal because the prolonged encasement in plaster produces atrophic changes.

We have been using double spica casts in the majority of our cases, because this fixes the pelvis more securely and prevents tilting, and also facilitates moving the patient with less discomfort. The excellent position of the fragments, shown in case two, with subsequent displacement emphasizes the need of frequent *x*-rays, and the greater safety in using the Whitman method of treatment. We recommend a walking caliper for all cases of this kind for a period of two to six months, following bed treatment. It is essential that calipers be carefully measured, for if not properly fitted there will result a coxa vara from too early weight bearing. Non-union is rare by this method of treatment. In fact one case, and the only case in this hospital in the last five years, obtained a firm bony union after eighteen months in a walking caliper.

Case 3.—I want to show this case as an example of a fracture into the knee joint, with an excellent functional recovery, and a very good anatomical result. This man sustained a comminuted fracture of the upper third of the tibia with three definite fracture lines extending into the articular surface of the tibia. He had about three inches shortening. He was treated by the use of skeletal traction; that is, a Steinman pin was put through the os calcis and extension applied for a period of three weeks, during which time the knee joint was frequently flexed. He now has 75 per cent normal motion in the knee joint, and has no shortening, and can do the same work he did before his accident. The important point to stress in the treatment of fractures extending into the knee joint is early motion to prevent ankylosis of the joint.

Case 4.—I wish to show this case as a splendid example of the good results which can be obtained in traumatic surgery by conservative measures, where modern facilities are available. On October 8th a truck backed into this man. He sustained a fracture of the lower third of the right femur, a crushing fracture of the first lumbar vertebra, and a fracture through the acetabulum on the opposite side. Traction was applied to the right femur by the use of calipers for a period of two weeks. At this time the position was very good. Calipers were removed, and soft tissue traction was applied below the knee for a period of five weeks. The other extremity was placed in a Thomas splint with ten pounds of traction for a period of four weeks. The extremity was mobilized each day. (Series of *x*-ray plates shown.) Patient was placed on a Bradford frame in hyperextension, the angle of extension being directly over the first lumbar vertebra. He now has no demonstrable shortening of either extremity. He has no pain in his back whatever, and is perfectly comfortable. He is just beginning to walk around, and we are not urging him to walk a great deal at present. He is getting physiotherapy, and is being treated for diabetes and syphilis. The results, which you see from these plates, are worthy of note, in view of the fact that the man is a diabetic and has had syphilis for twenty years. We do not believe that syphilis plays any important role in the healing of fractures. We believe that the majority of fractures through the lower third of the femur are best handled by the use of skeletal traction. The pull is more positive, requires less weight, and allows for complete mobilization of the joints above and below the point of fracture. Likewise the use of the Thomas Splint for fractures through the acetabulum allows full motion at the hip joint, as to flexion, rotation and abduction. This is particularly important in preventing ankylosis of the hip joint. In crushing fractures of the vertebræ where there is no evidence of paralysis, we believe that complete immobilization on a Bradford frame, with hyperextension of the spine at the point of fracture gives very satisfactory results.

Dr. O. J. Campbell presented the following cases:

Case 1.—The first patient, whom I wish to show, is a man, fifty-nine years of age, who, last October, sustained an intertrochanteric fracture of the left hip. He is of interest only because of the unusual accuracy of the reduction. Buck's extension, with slight abduction, was used from the first and maintained for twelve weeks. For the past five or six weeks there has been no apparatus used, the patient being kept in bed and sent daily to the physiotherapy department. He now has a good range of motion in his hip and is ready to walk with a crutch or upon walking calipers. Only the closest inspection of the film would enable one to detect the fracture line.

Case 2.—The next patient is a boy of eleven years whose right foot had been crushed by a train. The toes were amputated or hanging by shreds of tissue. The skin of the dorsum and the sole of the foot had been completely avulsed. As you can see, in the film, the metatarsals have all been fractured and driven through the sole. The navicular and first cuneiform bones have been displaced laterally. Upon first examination it seemed that nothing short of an amputation would avail. Amputation is particularly unfortunate in a child because of the attendant retardation of growth of the involved extremity. Accordingly a thorough debridement of the foot was done. The toes were removed and the fractures reduced as well as possible. Dakin's tubes were placed in and about the wound and irrigations were started immediately. Serious infection did not occur and after a week his fever returned to normal. We were unable to prevent the development of marked foot drop.

Last week we skin grafted the unhealed areas, using a number of implantation grafts. We did this to get rid of all infection. The next step will be to lengthen the Achilles tendon and get the foot into a good position, following which, it is planned to swing the foot to the opposite thigh and by means of a pedicle flap, give him a fatty pad over the ends of the metatarsals. Finally a steel brace and arch support can be fitted.

We are not too optimistic but if the patient can get a foot which will bear weight, without pain, we can prevent, to a large degree, serious retardation of

growth. In a child of his age the effort does seem worth while.

Case 3.—This fracture of the left humerus was sustained in September of last year. The patient was put to bed and the arm was extended with the forearm flexed to ninety degrees. Extension was maintained for eight weeks and he was discharged with a fair and seemingly adequate callus. After two months he returned with obvious delayed union. The man was anxious to get back to work and the degree of motion at the fracture line was such as to make us feel that, even with a long period of immobilization, union would not occur. As you see on the film there has been a long free fragment. This fragment is firmly united to the proximal shaft. There is no union between the fragment and distal part of the shaft. He was operated upon and very dense scar tissue between the fragments was excised. The ends were freshened and a Parham band was applied around the united free fragment and the distal portion of the shaft. Bone chips were placed in the fracture line and around it. He now has good callus formation. As it is too early to allow him to go without some fixation, we have applied the plaster cast which you see. This cast firmly applied to thorax and shoulder, and maintaining the arm in slight abduction, is the best method we know to immobilize the humerus.

There is a complication of interest. He has a radial nerve palsy. The nerve was intact at operation and the greatest care was exercised in protecting it from injury. Considerable manipulation was necessary and it is believed that there was enough tension put on the nerve to bring about this condition. Sensation has returned but not muscular activity. We know that the nerve is intact and feel satisfied that he will, eventually, get full reurn of function.

Case 4.—This patient is forty-six years of age and was brought into the hospital two weeks ago, completely under the influence of alcohol. He had been found in the neighborhood, with a broken ankle and abrasions about the face.

Twelve hours after admission, the patient failing to void, catheterization was done and 900 c.c. of bloody urine removed. Two hours later 1,300 c.c. was obtained. I saw the patient the next morning, twenty-four hours after admission. The effect of the alcohol had worn off. At this time he had a rigid abdomen, temperature of 99.2 and leukocytosis of 10,000. Catherization again revealed a distended bladder and this time the catheter was retained and fastened in place.

The first diagnosis which suggested itself was ruptured bladder with developing peritonitis. The fact that the bladder had been found distended on several occasions seemed very much against this. Peritonitis from a ruptured viscus was considered unlikely, because of the mildness of his febrile reaction, the low leukocytosis and the absence of gas in the abdomen as demonstrated in the *x*-ray. A diagnosis of intra- or retroabdominal hemorrhage was made. In view of the length of time after the accident (probably about thirty-six hours) and the fact that the patient was improving, it was decided not to operate.

The patient improved steadily for five days. The urine became clear, in spite of which the catheter was retained in the bladder. Gradually he showed signs of paralytic ileus. Extreme distension followed. For a time we succeeded in getting gas through by means of Noble's enemas and pituitrin. He continued to vomit, the blood chlorides dropped to 429, his pulse and temperature rose slightly. On the eighth day, other means failing, we gave him a spinal anesthetic. While under the influence of the anesthesia, pituitrin was given and enormous quantities of gas were expelled. He improved rapidly after this. A daily injection of pituitrin was sufficient to keep him flaccid. He is now getting almost a full diet, and, as you can see, his abdomen is entirely soft and flat. His leukocyte count has never gone above 12,000 and has now dropped to 10,800.

Of interest is the large quantity of fluid needed to maintain his balance during the time he was vomiting so profusely. In one period of twenty-fours he was given 10,500 c.c. of normal salt solution by hypodermoclysis and 1,500 c.c. of 10 per cent glucose intravenously.

The question is—has this man had a perforated bladder. Cystoscopy was done about the fifth day and a small break in the bladder mucosa about 2 mm. long was described. We do not know whether this went through the bladder wall, but it was obviously the source of the hematuria, as the kidney shadows in the *x*-ray had been normal and there was at no time tenderness over the kidneys.

It is our impression that this man has had intra- or retroabdominal hemorrhage, giving him peritoneal irritation and later paralytic ileus.

Dr. Theodore H. Sweetser presented two cases:

Case 1.—As a corollary to my paper read at the November meeting, this patient, who is recovering from an operation for urinary extravasation, is presented to show the remarkable healing properties of the scrotum. As soon as the diagnosis was made, operation was performed—perineal urethrotomy with perineal drainage of bladder, very extensive incision for drainage consisting of bisection of the scrotum and trimming away of all necrotic tissue, and internal urethrotomy of the anterior urethra. The perineal urethrotomy wound has healed. The scrotal wound has shrunk remarkably and is almost covered with skin. Occasional passage of sounds will be needed to be sure of maintaining the full size of the anterior urethra.

Case 2.—A man twenty years old was admitted to the General Hospital in October, 1929, complaining of frequent burning urination, pain in the lower abdomen, and pyuria which had persisted in spite of treatment for gonorrhea for over a year. Physical examination was negative. Urine was of low fixed specific gravity, and showed pus and at times a few blood cells. P.S.P. tests and blood chemistry showed a very severe renal

insufficiency. After careful study on the medical service I was asked to examine him cystoscopically.

The bladder appeared normal, and the only clue to the diagnosis lay in the right pyeloureterogram. The moth-eaten pyelogram with extensions into the renal cortex and the irregularly dilated ureter were strongly suggestive of tuberculosis.

Although tubercle bacilli were not found in the urine at or even just after this cystoscopy, and the guinea pig inoculated with the urine obtained at cystoscopy failed to develop the disease, still one bacillus was found in the urine a week after the cystoscopy, and organisms have been found repeatedly since, though not in all specimens.

A second cystoscopy was done nine days after the first; there were at that time a few minute nodules in the musosa just below each ureteral orifice. The left pyeloureterogram shows filling defects, extensions into the renal cortex, and a marked irregular dilatation of the ureter.

The diagnosis, then, was definitely bilateral tuberculosis of kidneys and ureters with minimal involvement of the bladder. He was sent to the Glen Lake Sanatorium, where he now is.

From this case we learn that a diagnosis of renal tuberculosis may be difficult even with every facility at hand for its determination. Also we are warned that we should search for some reason, when a case does not respond to treatment in a reasonable time. This man may have had gonorrhea in July, 1928, but surely tuberculosis was the cause of his pyuria and urinary symptoms long before October, 1929.

Dr. A. R. Colvin: I didn't have the remotest idea of coming over here to discuss anything. I received a very kind message to come and attend a clinical meeting and I have enjoyed it immensely. The thing that has impressed me here all evening has been the eminently conservative manner of treatment and the good results. That knee case that was shown a short time ago was an evidence of the careful persistent keeping after a fracture which is so necessary in the treatment of fractures.

Before saying anything about fractures, I would like to recite a little experience with urinary extravasation, which is always a most interesting subject. As a third year student, I went out into the Alberta prairies to take the practice of another physician and just before he left he opened an abscess in a man's scrotum. The patient came back a short time later and I was horrified to find that the man was passing urine through his abscess opening. I had had then no experience along this line, but it happened that the physician whose place I was taking had a very good library and in looking through the literature I found a very valuable article by Sir Henry Thompson. One of the conditions that he referred to was a condition of multiple sinuses of the scrotum as a result of extravasation of urine due to stricture. These cases, when neglected, present themselves with multiple sinuses and when the patient urinates urine is passed through these various sinuses. Sir Henry Thompson in describing this condition called it a "watering pot scrotum." My patient had evidently a stricture of large caliber behind which developed a periurethral abscess and a consequent extravasation of urine. I was fortunate enough to be able to pass a catheter into the bladder and in this way the urethral fistula closed. However, perineal section is usually required and always in the old neglected cases.

Another case which I remember very clearly is that of a patient who had lost the entire scrotal skin and almost the entire skin of the penis as a result of cellulitis of the scrotum. The skin is, however, usually not entirely lost. After a certain amount of destruction has taken place the remaining skin retracts up around the root of the penis. After a healthy condition of granulations has been established, the skin is gradually pulled down again and in a surprisingly short time the scrotum and penis become again covered with skin.

The thought that occurred to me about fractures as I listened to these cases was that I wondered why the Society hadn't spent more time discussing fractures of the neck of the femur. It seems to me that with the talent you have here you could discuss that subject for a long time. The case that interested me most was the case of the woman who walked in here whose *x*-ray pictures showed a great deal of absorption of the neck and still she had an excellent functional result. I have at present a patient whose subcapital fracture I put up in the approved Whitman position. I have *x*-ray pictures taken at about the end of the month showing absolute anatomical position. You can hardly tell there has been a fracture. A picture taken at the end of three months showed almost complete disappearance of the neck. There seems to be a growing conviction that absorption of the neck does occur even in the presence of correct treatment. Lorenz insists, however, that before we accept the condition of absorption in any given case we must be sure that we have correct and maintained reduction. It will thus be important, where our radiographs show good reduction, that we assure ourselves by frequent pictures that this is maintained. Provided that absorption has occurred is there still any chance of union? Speed, of Chicago, writing of non-uniting fractures of the neck insists on remanipulation and again putting up in a cast for a long time. Inasmuch as just in these cases of complete absorption reconstruction operations are less satisfactory it becomes important to follow Speed's advice. Anschutz, reviewing at great length in "Die Engebnisse der Chirurgie and Orthopoedie" the whole subject of fractures of the neck of the femur, acknowledges Whitman's method as the correct manner of treatment. He also cites cases with illustrations where prolonged treatment in cases with absorption of the neck has resulted in good functional result and in the radiograph shows a stable structural result.

It would seem important therefore to lay stress upon the persistent and continued treatment of the neck of the femur even in the presence of delayed union.

Dr. H. B. Sweetser: My experience goes back to before the day of the *x*-ray, when we were obliged to depend entirely on clinical methods for diagnosis and a check-up on the results of treatment; and the results frequently left much to be desired. I was therefore very much interested in this series of *x*-ray plates, showing the position of the fragments before and after reduction, and, at intervals afterwards, whether reduction has been maintained, and if the progress made in ossification is satisfactory.

The *x*-ray and improved refinement in aseptic technic have aided immensely in the management of fractures and in the results attained.

Up to twenty years ago intracapsular fracture of the femur doomed the patient to non-uion and consequent loss of power to walk in almost one hundred per cent of the cases; today, by the Whitman method or by bone pegging, we may hope for union in a large proportion of the cases. In fractures entering a large joint, when the roentgenogram shows that the fragments cannot be put and held in perfect alignment, we no longer hesitate to open the joint and nail the fragments in their exact absolute relationship to each other.

The business meeting of the Society was held immediately following the program.

The election of officers for the ensuing year was held with nominations from the floor as no preliminary nominating committee had been appointed.

For the presidency the name of Dr. E. T. Green was presented by Dr. S. H. Baxter with a second nomination of Dr. A. T. Mann by Dr. E. A. Regnier. Dr. Mann was elected by a vote of 7 to 6.

For vice-president Dr. Theodore Sweetser was nominated and unanimously elected.

Dr. H. O. McPheeters was continued as secretary-treasurer, having been elected a year ago for a period of three years.

Dr. J. M. Hayes was re-elected to the council for a five-year term and Dr. Owen Wangensteen was elected to fill the unexpired term of Dr. Theodore Sweetser.

Drs. Tom Kinsella, O. J. Campbell, and R. P. Caron were elected to membership in the society.

There was a general discussion as to enlarging the membership of the society and whether or not surgical specialists might be included. The final decision was to continue as in the past, restricting membership to those who do only "general surgery" as was the idea when the organization formed.

The meeting adjourned at 10:30 p. m.

H. O. McPheeters, M.D.
Secretary.

Stated meeting held May 1, 1930

The President, Dr. S. R. Maxeiner, Presiding.

The Minneapolis Surgical Society met Thursday evening, May 1, at the home of the president, Dr. S. R. Maxeiner.

The society offers two prizes each year for the best thesis on the subject of clinical surgery. The essays this year were of an unusually high standard and quality and the competition was more keen than ever. Essays winning first and second awards were read at this meeting.

The essay winning first prize was written by Mr. Charles Rea, a senior in the University of Minnesota Medical School, on the subject of "Malignancy of the Undescended Testicle." This showed a large amount of original research work combined with a most complete and thorough résumé of the literature on this subject. It was a most valuable contribution to the profession.

The second prize was won by Dr. Evelyn G. McLane of Sleepy Eye, Minnesota. Dr. McLane made a complete résumé of all goiter cases which had been operated on at the New Asbury Hospital during the past five years. This brought out many very interesting facts and showed that the mortality rate at one of the best private hospitals was equal to that of the best clinics in the country.

The retiring president, Dr. S. R. Maxeiner, gave the address of the evening. This was on "Constructive Criticism for the Society." The work of the year was reviewed generally and plans outlined for the coming year.

CONSTRUCTIVE CRITICISM

Stanley R. Maxeiner, M.D., F.A.C.S.

Mr. Chairman and Members of the Minneapolis Surgical Society:

Permit me to thank you for the honor which was conferred upon me when you elected me to your presidency. I also wish to thank you for your coöperation throughout the year as I fully realize that what success has been attained could not have been effected otherwise. Especially deserving of thanks are those members who have furnished the programs, those who have served on the Council, and, most of all, our efficient secretary, Doctor McPheeters, whose efforts have been untiring and spontaneous. I shall attempt to follow the precedent established by our last two past presidents by furnishing constructive remarks relative to the past and future of our society.

During the past year we have had eight meetings as usual and one excellent clinic. With an active membership of 36, we have had an average attendance of 18, or 50 per cent, which compares favorably with that of other organizations to which I belong. Two candidates have not given their initiation theses within the time limit and, as a result, have not become members. Several members have not been especially active, while three new members have been elected and several other applications have been received. Although this society is still very young, we are building our reputation and I sincerely hope that in the near future it will be such an honor to be within its folds that every surgeon in Minneapolis will feel that he can ill afford not to belong.

Repeatedly discussion has occurred relative to including members of other branches of surgery, such as orthopedics, gynecology and urology, among our eligibles, but to date no action has been taken. The writer believes that the increase in members would be small but that many benefits might follow, from contact between our general surgeons and representatives of

these specialities. It is of such importance that it could well be given adequate time for ample discussion and final settlement.

At the suggestion of Doctor Webb, a suitable seal has been adopted and, as you have noted, has been used as a letterhead. This custom has been followed by other societies and lends certain dignity to our correspondence and notices.

Our constitution and by-laws drawn up in 1922 have been repeatedly amended so that one refers to them with difficulty. The original printed copies have been expended and it would seem advisable to have a committee to republish the revised articles. A copy should accompany the letter notifying new members of their election.

A committee composed of one or more members on each hospital staff to report interesting and instructive cases was appointed and I believe should be a valuable asset. Their work should be encouraged.

In 1927, your society adopted a resolution offering a prize for the best essay on a subject in the field of clinical surgery, students at the University of Minnesota working for the degree of Doctor of Medicine, or any interne in a Minneapolis hospital being eligible.

In 1929, one essay was offered and the prize was awarded to Doctor M. E. Knapp on "Afferent Nerve Supply of Blood Vessels." This, the second year of the prize essay contest, six essays have been submitted. Members of the Council who have had the opportunity to read these essays must all agree that they are of high calibre indeed, displaying a tremendous amount of effort in reviewing the literature and hospital records. From these six essays, two have been selected as winners, but the other four are of such excellent quality that it has not been an easy matter to pick the winners. I believe that all of the contestants who have not been fortunate enough to receive a prize award should be sent a letter by the secretary commending them upon the excellence of their work and notifying them that their paper has earned honorable mention. I believe that this would be a stimulus for the presentation of similar papers next year.

I have personally been so well pleased with the result of our prize essay contest this year that I believe in fostering this effort alone our Society justifies its existence.

I would also recommend that, hereafter, all essays be submitted with the understanding that if they are particularly worthy they may be published at the discretion of the Council even though they do not happen to win a prize.

This point brings up the matter of publication of the society's proceedings. Unfortunately all of the membership was not present at the discussion of this matter following the April meeting and as a result I am referring to the matter again. There is no question but what the standard of our scientific papers and the discussion of these papers will be of a higher standard when it is known that they are to be published. The published transactions of the New York and Philadelphia Societies furnish some of the very best material published in the surgical journals. All of us pick up the *Annals of Surgery* and turn to the transactions because we have a feeling that we will find something good. I believe that this society has membership with adequate material and sufficient brilliancy to render the same service through Minnesota Medicine.

One of the most important tasks confronting our officers is the arrangement of programs. Well do we know that attendance will be largely based upon the quality of the program at a given meeting, and how often have we seen nearly a full attendance when the speaker is a guest from another city, although his presentation may show no greater brilliancy than that displayed by some of our own members. This fact alone should be adequate reason, however, to invite prominent outsiders to make special trips to Minneapolis and to be on the alert to obtain their services when they may be passing through our city.

Since our first meeting in March, 1922, fifty-six prepared papers have been given, or an average of one per meeting. Of these, eighteen, or one-third, have been presented by invited guests. During the same interval, about the same number of members have reported cases of interest. Personally, the writer believes that many surgical truths are best illustrated by the presentation of a well prepared case report. The fact that case reports predominate would support this conclusion.

During the past few weeks I have talked to a number of members relative to the future policy of the society in regard to programs and, judging from suggestions made, combined with the fact that the American College of Surgeons, the Inter-State Post-Graduate Medical Association, the State Medical and others have considered two subjects of prime importance, namely traumatic surgery and cancer, I believe that it might be well for us to consider a whole series of papers in the nature of a symposium on either subject.

The great divergence of opinion as to the rating of permanent disability in industrial cases often makes us the laughing stock of those familiar with the transactions of the Industrial Commission. I believe it is entirely possible that, through the agency of the members of the Surgical Society and those practicing orthopedic surgery and especially those who major in traumatic surgery, some scale could be arranged whereby this discrepancy would no longer exist. At present the law states exactly what the disability is for certain amputations. They might readily specify what the disability would be for the loss of varying degrees of function of the elbow and especially when the elbow is ankylosed in a favorable or an unfavorable position. Some sort of a standardization ought to be possible.

The fact that it is estimated that 300,000 persons in the United States have cancer at the present time and that theoretically early cancer is curable, places the cancer problem foremost among surgical topics. The early diagnosis and standardized treatment of cancer in its various locations may very readily constitute another symposium of surgical essays.

In closing, it may not be amiss to call attention to the fact that we are approaching our tenth anniversary. I think that even at this time we might begin to make

plans for some very special events to celebrate. For instance, one or two special meetings with extraordinary speakers or clinics. You will all remember that years ago Minneapolis had a clinic week at which time all of the doctors of the state were invited to attend the scientific programs and clinics. For some reason or other this clinic week was discontinued. I feel that our society might invite all of the doctors throughout the state to come to Minneapolis for a two-day surgical program put on entirely by our Surgical Society in which papers could be rendered by its members, together with operative clinics. As quoted in our constitution, the purpose of our society is both scientific and social. I believe that a clinic week would fulfill both of these purposes and would reflect much credit upon our society, and let the rest of the state know the excellence of the surgical work that is being done in Minneapolis.

Dr. Kenneth Bulkley reported the following two cases of malignancy of the large bowel in young people.

I would like to report briefly the two following rather similar cases which I feel sure would be of interest. Both of the patients are still in the hospital. Both are cases of malignancy of the large gut in relatively young people.

The first case is that of a boy twenty-four years of age with indefinitc abdominal symptoms of which the most predominant was gas. There has been practically no pain, no loss of weight, no true obstructive symptoms. Except for *x*-ray findings his physical examination was negative. A barium enema could not be forced beyond the hepatic flexure. Barium by mouth gave no positive findings other than excessive peristalsis in the ascending colon. Stool examination was negative. At operation an annular carcinoma of the hepatic flexure was found and resected. No metastases anywhere were evident. A typical Mikulicz operation was done and a few days ago I closed his fecal fistula.

The second case is that of a boy of twenty-nine upon whom I operated this evening. This boy three years ago had had a clean appendectomy. Ever since then he has had much abdominal gas, both stomach and intestinal. He has lost no weight; he has had no pain referable to his abdomen. This morning he vomited his breakfast and had abdominal cramps. We started an *x*-ray study on this boy but due to increased distention and persistent vomiting it was not carried to a completion and it seemed wiser to operate on him without further investigation, the operation being done under the diagnosis of intestinal obstruction probably due to bands. Inexcusably, no rectal examination was done and it is largely to point out this error that I report this case. The diagnosis seemed so clear as to the cause of obstruction that the rectal examination was omitted. At operation, however, this boy was found to have a large carcinoma of his rectum fixed to surrounding structures and lying immediately above the levator ani muscle. Again no metastases could be found. The mass had ulcerated through and perforated on its anterior surface with a resulting accumulation of foul smelling fluid in the true pelvis. There were a few adhesions from his old operation but these were not responsible for his obstruction. The lower abdomen was drained and through a left rectus incision a sigmoidostomy was done.

These cases seemed of interest both from a viewpoint of diagnosis and from a viewpoint of rarity. In the first case the differential diagnosis lay between a carcinoma of the hepatic flexure or a tuberculosis of the cecum and ascending colon. In the second case the diagnosis of the cause of the obstruction was wrong. It should have been made without any difficulty had a rectal examination been done.

Dr. S. R. Maxeiner presented the following case of cleft palate:

Miss K. F. is a sixteen-year old student.

Family history is entirely negative, no history of tuberculosis, cancer or congenital deformity being obtained.

Past History: Patient has never been seriously ill and has never had any severe accidents.

Present Complaint. Patient was born with a cleft palate involving the posterior four-fifths which was operated upon twice when the patient was two years of age, with almost complete failure. Patient came to us with a large rounded hole in the roof of the mouth, approximately 2 cm. wide and 3.5 cm. in length. Examination was entirely negative, patient being otherwise well developed and physically and mentally normal, except for very greatly enlarged, cryptic tonsils.

Operative Procedures: On November 4, 1929, tonsillectomy was performed and the patient sent home with instructions to report six months later for operation upon her palate.

Stage 1. On April 15, 1930, under local anesthesia, the mucoperiosteum was separated on both sides of the cleft, extending outward to the teeth and running forward to the alveolar arch. This completely loosened the entire palate and the edges of the cleft could be readily approximated without tension. The flaps were penetrated on both sides at the teeth and a packing of iodoform gauze gently placed underneath the flaps. No attempt was made to suture the cleft.

Stage 2. On April 22, 1930, under local anesthesia the flaps were again lifted and the edges pared and approximated without tension with dermal sutures. One mattress dermal tension suture tied over buttons was also used to prevent any traction upon the line of suture. This stage of the operation proceeded with so little effect upon the patient that we determined to attempt to lengthen the posterior edge of the palate, which was altogether too short and was the only part that had been successful at the time of the original operation. After the technic of Brophy, the posterior edge of the palate was freshened. Both pillars on both sides were cut three-fourths of the distance through the palatopharyngeal muscles and the freed upper edges of these flaps were brought together as recommended by Brophy, so that the palate was lengthened three-

quarters of an inch. A second tension suture was introduced and anchored over buttons.

This patient seems of special interest, inasmuch as she has had two previous operations in infancy with almost complete failure. The present operation has been followed by primary healing throughout. The opening in the palate has been completely closed and the palate has been lengthened about three-fourths of an inch. The sutures, which are still in place, will be removed tomorrow, the eleventh day. I believe that we must attribute a large part of this success to the use of the delayed flaps or the two-stage operation, as recommended by New.

Following the scientific meeting Dr. A. T. Mann, the new president, was escorted to the chair and conducted a brief business meeting.

The meeting adjourned until October, 1930.

H. O. McPheeters, M.D.
Secretary

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
205 W. 2nd STREET, DULUTH

THOMAS A. PEPPARD,
MEDICAL ARTS BLDG., MINNEAPOLIS

THE RELIABILITY OF GUINEA PIG INOCULATIONS IN THE DIAGNOSIS OF TUBERCULOSIS: Abstract of a paper by T. B. Magath and W. H. Feldman, read before the Trudeau Medical Society, Rochester, Minnesota, March 29, 1930; to be published in American Review of Tuberculosis. In order to evaluate the reliability of inoculation of guinea pigs in the determination of obscure tuberculous infections, a study was undertaken to ascertain, first, if the tissues of guinea pigs which failed to reveal at necropsy gross tuberculous lesions contained histopathologic evidence of tuberculosis, and second, what should be considered of significance in the histologic examination of tissues of guinea pigs in minimizing possible diagnostic errors.

Use was made of material consisting of catheterized urine from the ureters and bladder, tissues from bones and joints, thoracic fluids, and miscellaneous tissues obtained from the Section on Clinical Pathology of the Mayo Clinic. The material which was negative for *mycobacterium tuberculosis*, by the usual microscopic examination, represented 158 consecutive cases.

Two guinea pigs were given injections with portions of each specimen, one subcutaneously and one intraperitoneally, and those living at the expiration of eight weeks were killed and necropsy was performed. The presence or absence of a tuberculous infection was determined as a routine by the gross appearance of the viscera. By this procedure, twenty-one of the cases were eventually considered tuberculous. The liver and spleen of 201 of the guinea pigs which died or were killed subsequent to inoculation, and which were considered nontuberculous at the time of necropsy, were examined by appropriate histologic methods for possible lesions of tuberculosis.

Although occasionally tissue was found which possessed alterations simulating in some degree the morphologic reaction to the organism of tuberculosis, the failure to demonstrate the causative organism was considered decisive in designating each of these lesions as nontuberculous.

In a study of the reactions of tissue subsequent to a definitely tuberculous infection it was found that undue significance should not be placed on the cellular aspects of the lesion. The presence of giant cells of Langhans type may be particularly misleading. In guinea pigs affected with tuberculosis, and on which necropsy is done eight weeks subsequent to exposure, giant cells are not an essential part of the lesions and usually are absent. By appropriate staining methods, acid-fast bacilli can be found among the cells of the cellular detritus in practically every instance in which the lesions are those of tuberculosis, and failure to observe acid-fast organisms in lesions which are typically not those of tuberculosis is presumptive evidence that the condition is nontuberculous.

The data obtained in this study have established the reliability of inoculation of guinea pigs in the diagnosis of tuberculosis. Animals which live eight weeks subsequent to injection and which fail to reveal gross lesions of tuberculosis at necropsy, in all probability do not possess a tuberculous infection, and the routine histologic examination of such tissues is not necessary. When a histologic study is done, the presence or absence of acid-fast bacilli rather than the specific nature of the cellular reaction constitute the most dependable criteria in reaching a decision.

William H. Feldman, V.M.D., M.S.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
MEDICAL ARTS BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

EPITUBERCULOSIS: Phillip E. Rothman, M.D., Los Angeles (Arch. of Ped., March, 1930, Vol. XLVII, No. 3). Epituberculosis consists of a large area of pulmonary consolidation associated with enlarged mediastinal tuberculous glands. The consolidation may

persist for many months, but ultimately resolves with little or no permanent lung damage. The onset is insidious and none of the case reports include early signs or symptoms of any constancy. The child's general condition is fairly good and there is usually no dyspnea, polypnea, or diminution in the degree of expansion of the affected side.

The physical signs are those of consolidation with dullness, slightly distant tubular breathing, but with a great paucity of râles or even none at all. An ordinary pneumonic process is suspected. The tuberculin test, however, is invariably positive and the *x*-ray shows a wide mediastinal shadow in addition to a homeogeneously dense consolidation.

The insidious onset, positive tuberculin test and long duration speak for epituberculosis. The absence of tubercle bacilli in the sputum is a very helpful point in differentiating this condition from caseous pneumonia.

Some have maintained that it represents an allergic response in patients previously infected with tuberculosis; whereas, others feel that it is an atelectatic or collapsed portion of lung resulting from regional swelling of bronchial lymph-nodes with lymphatic stasis or actual pressure on the bronchi. It is generally believed that the process is simply an inflammatory reaction about a tuberculous focus in either the mediastinal glands or lung tissue, and that it contains no tubercle bacilli. In this respect it is non-specific, but it is specific in the sense that it is always secondary to or associated with a tuberculous infection.

R. N. Andrews, M.D.

TUBERCULOSIS IN INFANCY AND CHILDHOOD: Nursemaids as a Source of Infection—Henry Dietrich, M.D., Los Angeles (Arch. of Ped., March, 1930, Vol. XLVII, No. 3). It is only during the past few decades that we have begun to realize the frequency and gravity of tuberculosis infections in the young child. Tuberculosis is a disease of childhood. It generally begins in childhood and therefore our preventive measures must be aimed particularly at this period of life. The tubercle bacillus, once implanted in the body of the child, finds a most fertile soil for its growth and, as we know, even if apparently overpowered by the body forces, may at any time in the future light up and blight or destroy a useful life.

The following four facts about tuberculosis are now well established: (1) Tuberculosis is an acquired and therefore preventable disease. (2) The tuberculous patient is generally the source of infection. (3) The great majority of infections in man are air-borne. (4) The younger the individual the greater the susceptibility and the more dangerous the disease.

It may require only a few hours a day of association with an open tuberculosis to infect and perhaps destroy the young infant or child. A tuberculous nursemaid or governess not only is a menace to her own household but frequently also comes in close contact with many of the children in the neighborhood.

Today we demand a tuberculin test of our dairy cattle. We ask for a health examination of the employees of our certified dairies and of many employees in other industries. Boiling the milk will destroy the tubercle bacillus. Nothing except removal of the person with a tuberculous focus will protect the child against infection. We must demand a health examination of all persons making it their business to care for or help care for infants and children.

R. N. Andrews, M.D.

EYE, EAR, NOSE AND THROAT

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RELIEF OF NASAL OBSTRUCTION IN CHILDREN DUE TO DEVIATION OF THE SEPTUM: W. W. Carter, M.D., New York City (Ann. of Otol., Rhin. and Laryng., Vol. 39, No. 1, pp. 199, Mar. 1930). The author mentions the difference of opinion among our ablest rhinologists as to the method to be employed for relief of nasal obstruction, and the extent of operative interference permissible at an age before nasal development is complete.

The author feels that the extensive removal of the septum in the very young is not the procedure of choice. He believes that the septum is a very prominent factor in the development of the flattened infant nose into the prominent adult nose. For that reason he does not accept the complete submucous resection of the septum as the operation of choice.

He cites the dynamics of nasal development and shows that the septum is by far the most important factor. For that reason the septum must be preserved to the greatest extent consistent with relief of obstruction.

His method follows: Ether anesthesia, the usual vertical submucous resection incision is made and the mucosa elevated on that side. Then he inserts the submucous knife into the sac and makes two parallel incisions from behind forward on either side of the apex of the deflection. These incisions extend only through the cartilage. Next this narrow strip of cartilage is removed. An incision is next made through the upper segment parallel with the dorsum of the nose and the entire length of the deflection. A corresponding incision is made below and parallel with the floor of the nose. These two incisions destroy the resiliency of the cartilage. Next the septum is lined up in its normal vertical position. Then gold wire splints are introduced into each nostril and moulded to fit the case. These splints should remain in the nose for 10 days, and the nose cleansed daily with an alkaline solution.

Immobilization of the nose with a lined copper splint is essential.

Arthur C. Dean, M.D., F.A.C.S.

MASTOIDITIS WITH GASTROINTESTINAL DISTURBANCES IN INFANTS: John W. Carmack, M.D., Indianapolis (Ann. of Otol., Rhinol. and Laryngol,. Vol. 39, No. 1, p. 75, March, 1930). The author says that since 1921 the relation between gastro-enteritis and mastoiditis in infants has been recognized by Renaud, Byfield and Dean. There has, however, been some conflicting opinions as to the advisability of mastoid drainage externally, as well as the proper time for interference. He divides these cases into two groups: First, in which there is an acute respiratory infection, including the middle ear and mastoid, together with a violent enteritis, dehydration and toxemia; second, in which there is mastoiditis, but it is doubtful whether the gastrointestinal disturbance is due to actual infection of the bowel or to a toxic disturbance. This latter group has much less violent symptomatology of the gastrointestinal tract.

In twenty-eight infants, twenty-one were operated on for both mastoids at the same time; of the seven remaining it was necessary to operate on the other side later in four. The most unsatisfactory results were obtained in the patients operated on during the active stage of a dehydrating diarrhea and high temperature. There is much to be desired in the standardization of our ideas as to the time for operation and the preoperative and postoperative treatment. The diagnosis and proper course to pursue can only be determined by the closest coöperation between the otolaryngologist, the pediatrician and the roentgenologist.

The appearance of the drum membrane is not always a safe criterion of the pathology inside. Few, if any, infants with gastrointestinal disturbances have normal drum membranes. External mastoid signs have been notably absent. *X*-ray plates are valuable but very difficult to interpret. It seems that the normal mastoid space is larger than formerly believed in the first and second years of life. Cell formation has been seen frequently as early as one year of age.

The most satisfactory time for operation is after the acute storm subsides. Preoperative treatment consists in restoring the body fluids, and blood transfusion where hemoglobin is under 70 and red blood cells under 4,000,000.

All operations are done under novocaine and codeine. The wound is left open and heals by granulation. Postoperative care is supportive and stimulating. Fluid and food are pushed. Repeated transfusions if necessary.

CONCLUSIONS

1. Mastoiditis may occur coincidental with an acute respiratory and gastrointestinal infection and may become an important factor in the outcome of the case; in others, the mastoid may become involved and remain as a focus of infection producing gastrointestinal symptoms of a toxic nature or subsequent intestinal infection.

2. Surgical intervention cannot be decided upon intelligently without close coöperation between the pediatrician, the otolaryngologist and the roentgenologist, but no mastoid should be opened without clinical evidence of disease in the mastoid space.

3. Adequate preoperative and postoperative treatment is of vital importance.

4. All infants with marked or continued gastrointestinal disturbance should have careful ear examinations, and if pathology is found, early and free drum incision should be made. If the mastoid is involved and satisfactory improvement is not had by ear drainage a mastoid operation is indicated.

5. Operation, except in the occasional case, should not be attempted during the violent gastrointestinal crisis.

ARTHUR C. DEAN, M.D., F.A.C.S.

ROENTGENOLOGY

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ROENTGENOGRAPHY OF THE KIDNEYS AND URINARY TRACT BY MEANS OF INTRAVENOUS INJECTION OF A NEW CONTRAST MEDIUM, UROSELECTAN: M. Swick (Klin. Wchnschr., November 5, 1929, p. 2087). While investigating the excretion of Selectan-Neutral, which had been used therapeutically in the treatment of different coccus infections, it was discovered that excretion was more marked through the kidneys than through the bile. The first results by intravenous injection in animals were only sufficiently satisfactory to indicate the possibility of the method if the affinity for the kidney and the solubility of the substance could be improved. Oral administration in man was not successful. Continued investigation with the coöperation of the chemical institute finally evolved a substance which answered the requirements of safety, free solubility and marked excretion by the kidneys. This has been named Uroselectan. The iodine content of this drug is 42 per cent. It is well tolerated intravenously by mice and squirrels and when injected intravenously in man in proportionately much smaller amounts, yields very satisfactory pyelograms. The density of the picture depends directly on the condition of the kidney, as does also the time at which the best picture is obtained. The latter varies from one to two hours in the presence of good kidney function to 24 or even 32 hours in poor function. When function is very poor, no shadow is obtained. Whether normally or slowly excreted, the drug is not demonstrable in the blood after fifteen minutes. What becomes of the substance when not excreted has not been determined. In the clinical tests there were no deleterious effects of consequence. Death nineteen hours after injection in a girl of ten was shown to be due to the severe and advanced nature of the pathological conditions. The conclusion is

that Uroselectan is remarkably well tolerated in all surgical kidney diseases.

After intravenous administration, performance of which is very simple, films are taken at intervals, depending upon the rapidity of excretion. Fluroscopy was also employed.

Reproductions of eight typical urograms are included. EDWARD SCHONS.

CLINICAL TRIAL OF UROSELECTAN: A von Lichtenberg and M. Swick (Klin. Wchnschr., November 5, 1929, p. 2089). This new substance promises extensive clinical applicability of intravenous urography. The method offers in cases of sufficient kidney function satisfactory urography; in all cases a roentgenological function test, as well as a new chemical function test.

All cases examined with Uroselectan were controlled by direct pyelography and the results compared. Of 84 cases examined, the results were checked operatively in 35 cases and by autopsy in 1 case. The results with Uroselectan were technically successful and the pictures serviceable for diagnosis. No shadow indicated always either absence of the kidney or marked impairment of kidney function. The shadow was thus absent in advanced kidney tumor, pyonephrosis, severely infected obstructed kidney; also in marked cardiac insufficiency. In all cases of marked or total obstruction if accompanied by infection the shadow was absent. In cases of hydronephrosis, ureteral stone and high grade renal disease due to stone, excellent pyelograms were obtained. A very interesting case of closed tuberculous pyonephrosis showed cavities in the upper half of the kidney.

The method was used in nearly all forms of primary and secondary surgical kidney pathology. In prostatic hypertrophy the dilatation of the pelves and ureters was well shown.

Prof. von Lichtenberg is very enthusiastic about the possibility of studying the function of the ureters.

In 61 out of 84 cases examined, fully sufficient information for the preliminary handling of the case was obtained, cystoscopy, ureteral catheterization and pyelography being necessary in the remainder. In 75 cases information as to function was sufficient to determine the operative indications. In all cases was the examination of the case expedited and simplified and in 70 per cent could more radical examination be avoided.

Indications for intravenous pyelography are given as follows: (1) Cases where direct cystoscopy, ureteral catheterization and pyelography cannot be done because of anatomical, pathological or technical reasons; (2) cases of obstruction where direct injection can be done only to the point of obstruction; (3) where the ordinary method is risky.

No contraindications are at present mentioned, but it is stated that so far the ureters are often better shown by the old method.

EDWARD SCHONS.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

TREATMENT OF SKIN DISEASES—IN DETAIL. Noxon Toomey, M.D., F.A.C.P. Late instructor in Dermatology, St. Louis University, Major and Surgeon, 138th Infantry, Missouri National Guard, Dermatologist to the Terminal Railroad, sometime editor of the Urologic and Cutaneous Review. 512 pages. Cloth, $7.50. St. Louis: The Lister Medical Press, 1930.

BULLETIN OF THE NATIONAL RESEARCH COUNCIL, No. 73. A survey of the Law Concerning Dead Human Bodies. George H. Weinmann. Issued under the auspices of the Committee on Medicolegal Problems, National Research Council. 199 pages. Paper, $2.00. Washington, D. C.: National Research Council, 1929.

UTERINE TUMORS. Charles C. Norris, M.D., Professor of Gynecology and Obstetrics and Director of the Department, University of Pennsylvania; Gynecologist and Obstetrician, Hospital of the University of Pennsylvania, Henry Phipps Institute of the University of Pennsylvania. 251 pages. Illus. Price $3.00. New York: Harper & Brothers, 1930.

LECTURES ON COLONIC THERAPY. O. Boto Schellberg. 55 pages. Illus. Price $2.00. New York: The Oboschell Corporation, 1930.

DIABETES—Directions for Treatment by Insulin and Diet. Benjamin F. Smith, M.D. Physician and lecturer to St. Joseph's Infirmary, Hermann Hospital, and Jefferson Davis Hospital, Houston, Texas. 223 pages. Price, cloth $2.00. New York: D. Appleton & Company.

TUBERCULOSIS AMONG CHILDREN—J. Arthur Myers, Ph.D., M.D., F.A.C.P., Chief of Medical Staff Lymanhurst School for Tuberculous Children, Associate Professor of Preventive Medicine, University of Minnesota. Chapters by C. A. Stewart, M.D., Ph.D., and Paul W. Giessler, M.D., of the University of Minnesota. 208 pages. Illus. Cloth, $3.50. Springfield, Illinois: Chas. C. Thomas, 1930.

INJECTION TREATMENT OF INTERNAL HEMORRHOIDS—Marrion C. Pruitt. 137 pages. Illustrated. Price $3.00. The C. V. Mosby Co., St. Louis, 1929.

In this book there is a general discussion of hemorrhoids, including anatomy, etiology, prophylaxis, history, etc. The author expresses his own opinion and in-

cludes that of other authorities on the subject. A classification of hemorrhoids is given, and symptoms and other conditions of the anus are considered.

The second half of the book is devoted to discussion of the injection treatment, giving indications, contraindications and various solutions used. The author's idea of treatment is clearly given and necessary illustrations are included; also a series of case reports.

The book lives up to its title and covers the subject in such a manner so as to make it more practical than theoretical.

ARTHUR E. STOECKMANN, M.D.

PHYSIOLOGY FOR NURSES: W. G. Christian and Charles C. Haskell. Second Edition. $2.00. St. Louis: C. V. Mosby Co., 1929.

A rather complete volume that may be used if a nurse is familiar with anatomy.

It is well illustrated and particular attention has been paid to the chemical aspect. The volume is too brief, however, and not enough attention has been given food digestion and nervous system.

This volume could be used to advantage for review.

INEZ PEYTON.

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FOR SALE—One Kelley-Koett portable *x*-ray unit, complete, $450.00. Like new. Used slightly. Address 802 Donaldson Building, Minneapolis, Tel. Main 2904.

FOR SALE—Alpine mercury quartz lamp. Has burned only a few hours. Call Geneva 7959. 1953 Medical Arts Building, Minneapolis.

FOR SALE—New Hanovia lamp, large size, $250 cash. Address Dr. J. R. Sturre, 3402 University Ave. S. E., Minneapolis.

WANTED—Experienced technician desires temporary or part-time work with group of physicians or in hospital laboratory. Can furnish best of references. Address D-77, care MINNESOTA MEDICINE.

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WANTED—Medical man to share office, Lowry Medical Arts Building, Saint Paul. Office hours to suit. Well equipped. Telephone, Humboldt 4645.

POSITION WANTED in physician's office in or near Twin Cities by young woman physiotherapy technician. Can run urinalyses, make blood counts, also some *x*-ray. Eight years experience. Address D-65 care MINNESOTA MEDICINE.

WANTED—Position by experienced *x*-ray technician and physio-therapist, graduate of Swedish Hospital, Minneapolis. Can do general office work. Address D-75, care MINNESOTA MEDICINE.

WANTED—Physician for locum tenens, six weeks, starting July 1, Southern Minnesota town, 1,000 population. Address D-68, care MINNESOTA MEDICINE.

FOR SALE—Good general and well established practice with residence, in South Minneapolis. Leaving for West. Address D-79, c/o MINNESOTA MEDICINE.

MINNESOTA MEDICINE

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LORD LISTER*

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Bismarck, North Dakota

MANY speeches have been made and books written for the purpose of calling attention to Lister's monumental addition to the structure we call modern civilization. His life, his character, and his grand gift to the human race have been described repeatedly and well. The object of this contribution, therefore, is not to add any new glory to this man, or his work. It is but a humble effort of asking the brethren to pause for a few moments in appreciative contemplation of the evangelist who first taught the world methods of overcoming the demon, SEPSIS, and who pointed out the way along which we are progressing, slowly and stumblingly, but progressing, to better and happier lives.

A medical historian, a few years ago, said that surgery is divided into two periods, first, the period before Lister, and second, the period after Lister. It will not be necessary for us to say anything about this second period or era in surgery. We have this around us all the time; it is a present-day reality through which we are plodding every day.

The period before Lister, however, was so radically different from the surgery with which we are familiar, that we might find it difficult even to recognize it as surgery. In former days only a very small number of our anatomic structures were admissible for surgical intervention. Most of the known diseases and injuries were left, for better or worse, to the tender mercies of the physician. The abdominal cavity was rarely touched by the surgeon and there was a good reason, for half or more of those who had their peritoneal cavities inspected, promptly died. In the thorax the only lesion treated surgically was empyema, which occasionally was punctured and opened before spontaneous rupture through the skin took place.

In the pre-Listerian age, major surgery was largely confined to amputations. This was a larger surgical field in the past than it is now for nearly all compound fractures required amputation. It was found that the patient had a better chance for life when the limb was amputated than he had when he retained the member and experienced fever, chills and pyemia which almost invariably followed open fractures.

The mortality records from various hospitals and surgeons about the beginning of the past century show that from 30 per cent to 50 per cent of all amputations were followed by death. In 1850 certain surgeons in Vienna and Paris were justly proud of their results after amputations, because they were able to report that only 25 per cent of their patients died. Military records made during the Napoleonic wars show that the amputation mortality among the wounded varied from 70 to 90 per cent.

The chief causes of these fatalities among postoperative patients were erysipelas, septicemia, pyemia, tetanus, and hospital gangrene. Epidemics of one or the other of these diseases occurred frequently among surgical patients in the hospitals. To our more enlightened minds, it is no wonder that these conditions prevailed when we learn that neither patient nor surgeon before operation was subjected to any other application of soap and water than that required for the sake of social propriety.

The instruments used in a major operation such as the amputation of a leg, were five or six artery forceps, a pair of scissors, and one or two long knives. These clumsy tools were probably washed or at least wiped off carefully after each operation, but had no other treatment than hon-

*Read at the Staff Meeting of the Bismarck Hospital, April 16, 1930.

ing of the knives before operation. Surgical dressings were made of discarded rags. It was the function of the Ladies' Aid Society from each hospital circle to search their wardrobes, garrets and cellars for cast-off garments and articles made of absorptive materials, tear them into suitable sizes, and bring them to the operating and dressing rooms of the hospital. In fairness it should be stated that the articles mentioned were usually if not always washed before they were brought to the hospital and used on the patient.

Many surgeons disdained the practice of certain other members of the profession of turning up their coat sleeves before operating. A few blood spots on the coat was prima facie evidence to the public that they beheld a busy surgeon. The same coat was sometimes worn until the sleeves were stiffened from dried blood clots. When the surgeon made his rounds in the hospital for the purpose of dressing his patients, he carried, hanging from a buttonhole, a wisp of ligatures—silk or linen, drawn through wax—in order to have them convenient for the control of postoperative hemorrhage. This complication was of frequent occurrence because the fifteen or twenty ligatures which had been left hanging out of the wound at the time of operation, often required traction for their removal.

The surgeon was anxious to do autopsies, then, as he is now, and he often interrupted his wound treatments and operations by doing postmortem examinations. We can readily understand, therefore, the close relation that existed between the operating table and the autopsy table.

Medical and surgical patients were not separated in the hospitals. Each patient, no matter what his ailment might be, was placed in the bed most readily available, thus mixing medical with surgical, and infectious with non-infectious patients without knowledge of the consequences. However, the surgeon had no difficulty in finding his own patients in the ward owing to the foul stench of putrefying flesh which always surrounded the surgical beds.

Surgical nursing as we understand it did not exist. The female attendants in the operating rooms and wards were handicapped, not only by ignorance, but by the old-time prudery which made it improper for a woman to expose the skin of her bared arms. Presumably, if one of the old dames of the Victorian Age could arise and take a glance into one of our modern operating rooms, she would promptly have a stroke of apoplexy and return to her grave.

The suppuration of wounds was spoken of as putrefaction and decomposition. It was believed that the underlying cause was the irritating influence of the oxygen in the air. Efforts were therefore made to exclude the air from the wounds by various forms of tight dressings, a practice which made matters worse and not better.

Surgical operations were practiced in prehistoric times and surgery occasionally had periods of remarkable development. Each period represented the existence of some one great physician, leader, teacher, and master who had exceptional powers of observation and clinical judgment, and gathered a group of disciples about him. After a generation or two the art would fall by the wayside and be forgotten again for a few hundred years, or until the arrival of another man of genius. The histories of Babylonia, Egypt, and Greece prove this statement. Even toward the end of the Eighteenth Century surgery was limited to small procedures, such as we usually include under the term of minor surgery. This was done as a rule not by the physicians of that day, but was practiced by barbers and others who had become adepts at opening boils, setting fractures, and removing foreign bodies which were easily accessible.

In the Nineteenth Century, knowledge increased so rapidly that it was necessary to differentiate its various branches. We may say that science, *i. e.*, classified knowledge, dates back to about the middle of the past century. Chemistry was early an advanced science. Among other chemical compounds developed about that time were carbolic acid, ether, and chloroform—all powerful drugs destined soon to become the most active agents in revolutionizing the healing art. Since it was thought that chemical reactions had so much to do with putrefaction in wounds, chemically trained minds became especially interested in this subject. The first reference to living microörganisms was made by Heister in 1857. He arrived at his conclusions purely by logical reasoning, for he had no means of proving the existence of living germs. He even went so far as to state: "No germs, no pus."

Semmelweiss, an obstetrician in Vienna and later in Budapest, in 1865 had noted that the

mortality of mothers after delivery was 10 per cent when delivered by physicians, but only 3 per cent when attended solely by midwives. On the theory that physicians carried living infection from one patient to another, he carried out a number of investigations and inaugurated an obstetrical practice based on scrupulous cleanliness. This was followed by unbelievably brilliant results. Unfortunately, Semmelweiss with all his genius lacked the ability to convince his confrères and the rest of the world of his golden discovery. He was downed in his tracks, figuratively speaking, by critics and unkind satirists. His great idea was not appreciated fully until after his death. Honors commemorating his work have been heaped upon his memory although but few came to him while he lived.

For some inexplicable reason, the path of medical progress has always been strewn with obstacles and obstructions placed there ignorantly and viciously by those who should have been most vitally interested in making this path smooth. Those men who have made the most far-reaching discoveries have practically all gone through agonizing periods of criticisms, jealousies, and cynical and malicious attacks from members of their own profession. One can hardly find another walk in life where opposition to progress has been similarly maintained by those who should have known better.

The same opposition met Pasteur and hampered him for years in his endeavors to convince the world of his discoveries. The proofs he adduced were at first scorned by the medical profession but accepted early by chemists and botanists. His discovery and proof that bacteria cause infection and disease was also made about the middle of the past century.

Then came Lister. Joseph Lister was born at Upton, Essex, England, April 5, 1827. His father was a merchant of education and means who, for amusement, dabbled with problems in chemistry and physics. As one result of these hobbies, he made a decided improvement in the construction of the magnifying glass. From a toy he made it into a powerful engine for the investigation of the minute structures of animal and vegetable tissues. His son Joseph was a studious boy and with his father's magnifying glass began at an early age to study the histology of animal tissues. He devised a special knife with which he could cut slices of tissue much thinner than had formerly been done. While still a small schoolboy, he experimented with frogs in an attempt to learn why and how frogs changed their color, depending on the dgree of light or darkness in which they lived. For this purpose he blinded frogs and exposed part of their bodies to sunlight while keeping other parts in complete darkness. He found that frightening the frog would cause it to change color. The sciatic nerve was cut to determine whether this nerve connection controlled the color change in the frog's foot. At the same time he watched the circulation in the frog's webbed foot with his magnifying glass and found that irritating, or, as we know now, infecting, the web would produce congestion and thrombosis. These examples are given as a few of many to show that this man was born with an insatiable thirst for knowledge through research.

He was given a thorough classical education to which was added a serviceable knowledge of French and German. He graduated in medicine from London University in 1852. While a student he had the opportunity of seeing the first operation ever made under chloroform anesthesia.

After graduation he was an assistant to Prof. Syme of Edinburgh for a time, after which he was made clinical professor in the Medical College of Glasgow, where he remained until 1869. It was here he carried out his investigations resulting in the revolutionary changes of wound treatment. From Prof. Syme he had learned the great value of cleanliness in treating wounds. When he first came to Glasgow he was horrified by the deplorable hospital conditions and the high mortality among the surgical patients. He immediately set about to make those radical improvements in wound treatments which were destined soon to become copied by surgeons all over the world.

Convinced almost from the beginning of his practice that there was something besides the oxygen in the air which brought about putrefaction in wounds, he tried by numerous experiments to learn the true cause. Among the various chemicals employed in wound treatment, he found that carbolic acid was more useful than any other drug to promote healing. At first he applied it to the wound surfaces and in the dressings in the form of a 5 per cent paste. This was at once followed by a marked improvement in

the healing process and encouraged him to carry out still more experiments. The carbolic acid treatment was first used by him in 1865. The result of the treatment was welcomed first because of the reduction of the obnoxious odor about the surgical patients and later because of the very marked improvement in mortality. When the carbolic acid paste was applied to amputated stumps, about four patients out of five recovered and, more important, wounds with compound fractures would frequently heal without suppuration under this treatment and amputation be avoided. This was a startling upset of former conditions and convictions.

While Lister was still further experimenting and using his paste, someone told him of Pasteur's discoveries. Lister called on Pasteur and together the two went over the questions of fermentation, putrefaction and infection. Lister was big enough to recognize the value of Pasteur's work and to give him full credit for his accomplishments. He promptly adopted the new discoveries for practical surgical use. Lister and Pasteur became close friends as proved by their several meetings and the volume of correspondence remaining after them.

On his return home, Lister began to use a spray of a 2.5 per cent carbolic acid solution with the idea of killing the germs floating around in the air about the surgeon and the operative field. This apparatus was at first worked by hand but later more elaborate machinery was constructed and the pump and spray were operated by steam power. The older surgeons, smug in their time-honored convictions, wasted much ink in their vain efforts to ruin this "donkey engine" as it was called, by throwing monkey wrenches of satire among its gears.

The spray was continued throughout every operation, producing a foggy atmosphere about the operating table. The surgeon's finger often became blanched and numb from the acid. The irritating effect on nostrils, eyes, and bronchi was a most distressing feature to surgeon, assistants, and patient.

There was a still further improvement, and a marked improvement, in the results of wound treatment following the introduction of the carbolic acid spray. Lister now began to do more deliberate surgery by performing operations on bones for deformities, by opening joint cavities, and even risking incisions into parts of the body which heretofore had never been entered successfully in the living.

From descriptions of Lister's antiseptic surgical technic, we gather the following: The instruments were soaked in a 5 per cent carbolic acid watery solution for one-half hour before operation; the sponges, which were of the ordinary soft elastic bathroom variety, were also soaked in a 5 per cent solution. The skin was washed with the same strength while the patient was being anesthetized with chloroform. The surgeon removed his coat and rolled up his shirt sleeves and pinned a towel across his vest. These also were radical innovations. He washed his hands in the 2.5 per cent carbolic solution. The silver, silk, and silkworm-gut sutures were all soaked in the 2.5 per cent preparation. After operation the wound was rinsed with the same solution before closing and the dressings were steeped in the same strength before being applied to the wound. Somewhat late in his experience he discovered the use of catgut for ligation purposes and adopted cheesecloth and gauze for dressings.

Lister was an original thinker and a constant searcher after more facts. He studied carefully every new reaction in his experiments and every phase of the newly discovered laws of tissue damage and tissue repair. While his surgical technic perhaps would be considered mediocre by our present standards, it should be remembered that he was the pioneer and the pathfinder dominated by the daring courage of his convictions and that he blazed roughly the trail for those who came later with finer tools and nicer methods.

Many instruments and apparatus for bacteriological and surgical uses were devised by Lister. There are instruments first produced by him which are useful even today in operations on urethra, bladder, bones, and ear drums. Bloodless operations by means of the tourniquet were practiced by Lister several years before Esmarch produced his elastic bandage. The use of rubber tubes for drainage was another of Lister's innovations.

His success grew by leaps and bounds and his reputation as a surgeon did likewise. From Glasgow he returned to Edinburgh after a few years to become professor of surgery at the University, a position he held until 1878. His assistants and students were enthusiastic followers of this new system of surgery and spread his gos-

pel wherever they went. However, the opposition to him was so strong in England that antiseptic surgery was adopted all over the European continent and in the United States before the London surgeons would acknowledge its merits. Germany became the place of greatest development for the new surgical practice. One reason for this was the high standard of medical education set early by German educators, and the other reason was that animal experimentation and the study of bacteriology advanced more rapidly in Germany than in any other country. Indeed Lister's opponents in London were able to pass an antivivisection law which hampered the study of bacteriology and kindred subjects in Great Britain for a long time. In a letter written by Lister to Queen Victoria on this subject he said, "Without experiments on lower animals I could not possibly have made the advances in surgery which I have been privileged to inaugurate."

To the German surgeons much credit must be given for adopting so early and so enthusiastically Lister's teachings and for developing during the Eighties another radical advance in the art—aseptic surgery. The stolid London surgeons were obliged to learn later the technical steps of modern aseptic surgery from Germany. This was a galling experience in view of their unkind treatment of antiseptic surgery in the first place and because of their previous statements that more cleanliness in surgery was probably necessary among the Germans because they, in comparison with the British, "are such a dirty people."

Lister continued using his "donkey engine" spray until 1887, after he had become thoroughly convinced of the superiority of the aseptic technic as an improvement over his antiseptic practice. He described with keen surprise and satisfaction his first operation with "boiled" instruments. It was nothing more than the excision of a lipoma from a shoulder but the fact that the wound healed without even a tinge of redness about the stitches was a marvelous historical event to the discerning mind of Lister. He nevertheless used "boiled" instruments only tentatively and in minor operations for some time before his final conviction caused him to bid farewell forever to the world-famed "donkey engine."

But the day of triumph came to Lister as it had come, eventually, to Pasteur. In 1887 Lister was called to London as Professor of Surgery at King's College Hospital, a position he held for six years, or until his retirement. After his fame had become established in London, he enjoyed a constant stream of visitors of surgical students and admirers from Great Britain and from many foreign countries. Among these, because of their prominence in surgery not only in their time but for all time, may be mentioned Thiersch, Volkmann, Bardeleben, Mikulicz, Trendelenburg, Kocher, Bergman, and Lucas-Championniere.

In 1878, on a visit to his friend Pasteur in Paris, Lister was given unexpectedly a public demonstration which quite overwhelmed him, for he was a man of quiet, unassuming and humble nature, quite befitting his innate greatness. At a medical congress in Amsterdam he was given a special reception and an ovation from representatives of many nations. Prof. Virchow was the speaker of the day. In 1880 Lister was made a knight and in 1903 he became a peer and therefore a member of the Upper House in Parliament. He was given numerous decorations by Royalties of his own and other countries. In 1907 on his eightieth birthday anniversary, Lister celebrations took place not only in London, where it was said that there was a solid line of messenger boys with congratulatory missives on his doorstep from sunrise to sunset, but there were special celebrations in many foreign capitals. In 1909 his eyesight and hearing began to fail but his mental powers and his keen interests in life continued until the last year of his life. He died February 10, 1912.

The British government wished to bury his body in Westminster Abbey, but owing to a clause in his will, he was buried near his birthplace. However, the funeral rites took place in the Abbey, on which solemn occasion there were gathered princes, statesmen, dignitaries, and representatives from scientific bodies from many lands.

It is hard to realize that there are many people still living who remember the pre-Listerian times. There are many doctors still living who began their practice of medicine before the term asepsis was first conceived. We have lived at the very beginning of this new era and we have enjoyed life under the magnificent heritage given us by the two benefactors of mankind—Pasteur and Lister. No greater gifts were ever given by man to man than those given us through the ge-

nius and inspiration of these two men. As a result of their lives and labors, the average span of human life has been lengthened twelve years and more, not to mention our ability to make existence much more tolerable, pleasant and profitable for ourselves and for our successors. Great movements, national, religious, scientific, and economic, were originated by many men before Pasteur and Lister, but none of those movements have rendered as far-reaching service to all men in all nations as the practical application of the knowledge of bacteria has done. Those of us who know that we would have been rotting in our graves long before now but for the simple fact that we came to life late enough to enter the post-Listerian age—we have special reasons to think with gratitude, emotion, and reverence of the names PASTEUR and LISTER.

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SELECTION OF DRUGS IN HOSPITALS

The hospital should afford unusual opportunities for enhancing rational drug therapy. There particularly may products be submitted to critical inspection. As Sollmann so pointedly remarked at the recent Congress on Medical Education, the "evaluation of therapeutic remedies is not usually among the features to which hospital authorities point with just pride of achievement." The hospital drug room, which reflects directly the medicinal requests of the staff, has hardly kept pace with the modernization of other departments of the hospital. As for proprietary medicines, the shelves often remind us of what Irons aptly terms the "chain drug-soda-fountain-lunchroom." While in most medical schools the student receives good courses in pharmacology, materia medica and therapeutics and is made familiar with New and Non-official Remedies, it is unfortunately true that when the student becomes an intern in a hospital he finds not unfrequently that irrational prescriptions are written by the "chief" of a service, who has not kept pace with the trend of modern drug therapy. All too often he prescribes proprietary drugs when the same drug is obtainable under the pharmacopeial name at a much lower cost. To mitigate the evils of the prescribing of proprietaries, Irons has suggested the issuance of a hospital manual which shall contain hospital rules and a formulary. The Council on Medical Education with the coöperation of the Council on Pharmacy and Chemistry is following up the suggestion and considering the preparation of such a manual. (Jour. A. M. A., May 31, 1930, p. 1764.)

MINOR SURGERY*

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THE writer is very grateful for the honor of an invitation to give a paper before the Great Northern Railway Surgeons Association.

Minor surgery is the surgery of low mortality; it is the surgery which requires but few assistants and which generally is done in the out-patient department, or in the office, or in the home. It is an ever-present and integral part of general practice and, in fact, of general surgery. It is probably no exaggeration to say that the group of minor surgical conditions is as numerous as any other group which the physician has to treat. Because of the fortunate propensity of the body to cure most ailments spontaneously, much inefficient work is condoned in minor surgery. There is often wider diversity of opinion as to what constitutes good minor surgery than there is in the treatment of cholecystitis or pneumonia. The subject of minor surgery is commanding an increasing amount of interest and study and some of the most careful clinical and laboratory research will be necessary to decide disputed points.

The low mortality in minor surgical conditions is no reason why these conditions should not deserve the same careful thought and standardization of treatment which is present in the graver ailments. Skillful minor surgery greatly enhances the patient's comfort and reduces his morbidity. As Kanavel says, "There is no greater field for good surgery than is presented by minor surgery."

In engineering, architecture and other professions, the elementary courses are given before, and not simultaneously with, the major courses. It is quite possible that the medical schools of the future will give compulsory courses in minor surgery and that some, at least, of the major surgery will be taught in elective courses.

The strongest plea for the teaching and practice of good minor surgery is the fact that poor minor surgery not infrequently causes the development of grave surgical conditions which could have been avoided. "Too often," says Kanavel, "minor surgery becomes major surgery through carelessness or incompetence."

We are all familiar with the occurrence of grave generalized infections from trivial breaks in the skin. The writer has seen a staphylococcus septicemia with multiple bone metastases originating from a neglected blister of the heel. The presence of a slightly infected cutaneous wound becomes important when a trauma, as a strained muscle, occurs elsewhere in the body. The bacteria will often center and propagate in the locus resistentiæ minoris. Friction blisters should be prevented if possible. If they occur they should be protected. If they seem likely to rupture they may be opened under aseptic precautions through the intact adjacent skin. Once the blister be infected, the roof should be removed and the subjacent epithelium should be treated with a mild antiseptic such as mercurochrome ointment or a 5 per cent tannic acid ointment. Children are prone to acquire abrasions over the elbows or knees. These abrasions soon become infected and healing is delayed by the constant motion of the part. Rest, and wet boric dressings are indicated and where there is a tendency to crust formation with pus beneath the crust, the latter should be removed and an antiseptic ointment or wet dressing applied.

Meticulous early care of trivial lacerations will pay big dividends in the reduction of morbidity. The first concern in the treatment of a small wound is the control of hemorrhage. Frequently a tourniquet has been applied with such tension as to occlude the veins and not the arteries. It is a common experience to see bleeding cease on the removal of such a tourniquet. Pressure and elevation of the part will stop practically any venous bleeding and most bleeding from small arteries. The vascularity of the scalp lends itself particularly to bleeding. It is practically always futile to attempt the ligation of bleeding points in the scalp. The introduction of a few sutures will control such bleeding. Spurting arteries in muscle should be ligated. To attempt

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control of muscle bleeding by suturing the skin tightly over it is poor surgical technic; a hematoma and continued bleeding will practically always result.

The hair about the wound should be shaved and the skin cleansed and treated with an antiseptic before the introduction of an antiseptic into the wound.

Recent studies of skin antiseptics have brought forward interesting results. Simmons[1] concluded that tincture of iodine was much more effective than any solution of mercurochrome for use on an unbroken skin. German[2] found acriflavine (1:800 to 1:1600) to be more efficient than gentian violet, mercurochrome and picric acid. Allen,[3] while admitting that present methods of judging antiseptics do not constitute an accurate index of their practical worth, found the halogens to be much superior to the dyes (mercurochrome and acriflavine). The most recent and most interesting study is that of Raiziss, Severac, and Moetsch,[4] who studied the sterilizing properties of various antiseptics on the infected skin. Ethyl alcohol and hexyresorcinol (S. T. 37) were found to be extremely inefficient. Two per cent acriflavine gave sterilization in 80 per cent of the cases and 7 per cent iodine in 88 per cent. Five per cent iodine was ineffective. Two per cent mercurochrome-alcohol-acetone-water solution showed only seventy-nine per cent efficiency. On the other hand, 1:2500 dilution of metaphen produced one hundred per cent sterilization. Their studies indicated that better results were obtained with metaphen in dilutions 175 and 50 times greater than those employed for iodine and mercurochrome respectively. It is not improbable that metaphen, which is chemically mercuri —4, nitro—2, cresol, will become the antiseptic of choice for minor surgical wounds. It may be used in a dilution of 1:1200 to 1:2500. The writer also uses 2 per cent aqueous solution of mercurochrome and 1:1000 acriflavine solution. Tincture of iodine is rarely used. A two per cent mercurochrome ointment in a base of 10 per cent lanolin and 90 per cent vaseline is useful for some wounds.

A wound should never be sealed with collodion; tetanus has developed following the application of collodion to a "brush burn." Punctured wounds should always be given most careful attention. They are best carbolized, and where doubt as to the source of the wound exists, tetanus antitoxin is given after first ascertaining the patient's nonsusceptibility to horse serum. A rusty nail on a fence post may be perfectly safe because no anaërobic organisms can live on it, but the nail embedded in the garden dirt is the one to fear. Moreover, a so-called "clean" nail may drive into the foot tetanus organisms which were on the skin or the outside of the shoe. Great responsibility attaches to the omission of tetanus antitoxin. Exceeding care should be taken in ascertaining if the patient has recently had horse serum or is sensitive to horse serum. Fatal anaphylactic reactions have occurred where this precaution has been omitted. Where the suspicion of sensitivity exists, a drop or two of the diluted serum should be given and the patient be carefully observed for reaction. Should a reaction occur, adrenalin is to be exhibited. In cases where it is impossible to administer tetanus antitoxin, a thorough surgical excision of the wound should be done.

Approximation of wound edges usually greatly diminishes the time required for recovery and lessens the likelihood of infection. Unquestionably, however, too many sutures are introduced in most wounds, particularly in scalp wounds. Gaping scalp wounds 1 to 1.5 inches in length will heal very quickly without any sutures whatsoever, but merely a simple bandage. In small wounds where the skin is not in motion or subject to stress, an adhesive plaster dumbbell, the narrow portion of which does not exceed 1/16 to 1/8 of an inch, is probably superior to a suture. Michel clips are also useful, but difficult to put in. Where sutures are to be placed, the anesthetizing of the skin borders with local anesthesia is greatly appreciated by the patient. For this purpose 2 per cent novocain is injected by means of a short beveled 27 gauge needle into the intact skin border. Ragged wound edges should be trimmed off and deep wounds should be drained with a small piece of rubber or a very narrow strip of selvedged gauze packing. Where the skin flap is large, counter drainage openings should be made.

Furuncles and carbuncles should *not* be traumatized by squeezing or a dull knife. Of late softening poultices, unguents, and warm boric dressings have assumed a larger rôle in the treatment of furuncles than previously. In progressive carbuncles, Carp[5] has had some success in the injection of autogenous blood at the borders of the carbuncle. Three to six intracutaneous and subcutaneous circum-injections were made under

general anesthesia. Carp believes the pain is less, the time of cure less and that the scar is minimized by this method. The administration of 3 grain capsules of bisulphate of quinine seems to have a distinctly advantageous effect in these cases. The value of tin and manganese is still in question. The studies of Besredka[6] are very hopeful in this connection. He has found that the application of dressings wet with culture filtrates has a beneficial effect on furuncles. The experiences of Rice[7] in the treatment of boils with bacteriophage are very impressive. Marked improvement was noted after treating the furuncles with dressings moistened with bacteriophage or by injecting the bacteriophage into the furuncle. When fluctuation is present, incision must be generous and must be made by a sharp knife. The tiny "medical" incisions are painful and generally ineffectual. It is preferable to insert a small gauze or rubber drain for at least the first twenty-four hours. Carbuncles which do not respond to twenty-four hours of boric fomentations should be treated by radical surgical incision with under-cutting of the flaps. Furuncles are best incised under nitrous oxide or cautious freezing with ethyl chloride. Local anethesia solution should not be injected into an infected area.

Minor fractures are often overlooked. Lipping fractures of the phalanges may be missed because of the swelling if an *x*-ray is not taken and the true lesion undiscovered until the finger heals with a bony deformity. Magnuson[8] has clearly shown in fractures of the base finger phalanx how the lumbricalis muscle exercises an extension effect on the distal fragment with the result that, unless prevented, a flexion deformity will occur at the site of the fracture. Much skill and ingenuity must be exercised in the treatment of finger fractures. Thomson[9] first described the valuable method of applying traction in finger fractures by thread passed through a hole in the nail. Numerous other methods of applying traction in finger fractures have been devised. In some cases, bandaging over a roller bandage will suffice, but *x*-ray should not be omitted after the dressing has been applied.

Fractures of the metacarpals are particularly prone to dorsal deformity because of the pull of the interosseous muscle upon the fragments. This throws the distal head of the bone into the palm of the hand, making a painful prominence. Magnuson advises treating these fractures by posterior splinting with a dorsal pad over the point of the fracture and a palmar pad over the distal head.

Fractures of the base of the fifth metatarsal are commonly mistaken for sprains. Tenderness at the point of injury and *x*-ray will make the diagnosis. Immobilization in plaster of Paris will effect the quickest cure. Similarly small linear fractures of the scaphoid of the wrist will go without proper immobilization if accurate *x*-ray be omitted. Fractures of the epicondyles of the humerus may be mistaken for a sprain of the elbow.

Falls upon the head or upon the buttocks are often the cause of painful backs which sometimes are thought to be sprains. After a few days' rest most of the symptoms disappear, only to return upon resumption of activity. In these cases there may be a compression fracture of the vertebra which is only discernible in well made lateral *x*-rays. The treatment is rest in lordosis on a Bradford frame or in a cast for six to eight weeks and the wearing of a Taylor spine brace for four to six months. Dunlop and Parker[10] have devised a useful method of decompression of compressed vertebral fractures. The reduction is effected under anesthesia by tossing the patient and, with the back in hyperextension, catching his weight at the injured area across a taut sheet folded six inches wide while strong traction is made on the body. The reduction is often accomplished merely by increasing the amount of lordosis daily for a few days by arching up the back over pillows or sandbags or by the use of a properly elevating bed.

Small deep incised wounds of the fingers may be accompanied by section of the flexor digitorum profundus tendon, which may be overlooked unless the absence of flexion of the distal phalanx is noticed. The repair of these severed tendons is made through an incision on the side of the finger, avoiding as much as possible the flexion creases. For approximation of the cut tendon ends, the reinforced stitch of Bunnell is useful. Fine chromic catgut seems preferable for suture.

The search for needles and other foreign bodies presents a dismal chapter. Unless these objects are palpable, the operation for their removal should never be undertaken without fluoroscopic control and good assistance. Prolonged dissection under direct vision is not only often

futile but may be actually injurious to the extremity.

Failure to recognize some of the more uncommon skin infections may be disastrous. In anthrax the induration surrounding the lesion and the constitutional symptoms are more severe than in ordinary pyogenic infections. The diagnosis may be confirmed by examination of the pus in cultures and smears. The treatment is not local but the administration of anti-anthrax serum. The diagnosis of actinomycosis is made by finding the pin-head sized, sulphur yellow granules in the pus and the discovery of the organism (the ray-fungus). Complete excision is of great value in the early stages. In the later stages the fistulous tracts should be freely opened and curetted. The iodides are administered. Blastomycosis is a chronic infectious disease caused by the yeast fungus. The organism is readily found in the pus which has first been moistened with a 15 per cent potassium hydroxide solution. Potassium iodide and neo-arsphenamine are of value in the treatment. Surgery is employed only occasionally.

Even a circumcision may be poorly done. Too much or too little of the foreskin may be removed or bleeding points may not be properly controlled. Moreover circumcision is doubtless performed more frequently than need be. The principal indications are marked phimosis and balanitis. Dr. Pugsley of Bayard, Nebraska, has demonstrated how a paraphimosis may often be reduced without incision by the application of finger cots.

The failure to observe the proper technic of catheterization has led to many cases of stubborn cystitis.

Cauterization of the primary lesion of syphilis prevents the early treatment which a dark field examination would indicate.

A frequent cause of failure in the treatment of paronychial infections is the incomplete removal of the finger nail. The nail base may be torn off and left behind, where it acts as a foreign body and prolongs suppuration. Many paronychias are, of course, successfully treated by simple incision of the abscess, if present, at the nail border. The dangers of inadequate treatment of felons and tendon sheath infections are well known to all of us.

Additions to our knowledge of minor surgery are being made each year. Clinical research is clearing up disputed points. A few of the newer contributions may be mentioned.

The Winograd[11] operation for ingrown toe nails is a distinct advance over the older operations. The nail and nail bed are removed but the skin edge at the lateral border of the nail is left intact.

Since Davidson[12] in 1925 announced the tannic acid treatment of burns this method of treatment has come to be recognized as one of the outstanding therapeutic contributions of the generation. The patient is placed in a heated tent and his naked skin, from which any grease has been removed, is sprayed every 15 minutes with a 5 to 10 per cent freshly prepared aqueous solution of tannic acid until the burned areas are dark brown or black and are thoroughly tanned. In extensive superficial burns the blood becomes highly concentrated. This concentration of the blood is readily demonstrated by hemoglobin estimations. Hemoglobin of 125 per cent is the danger level according to Underhill[13]; as high as 163 per cent has been reported. The active administration of fluids is energetically indicated to combat this blood concentration. At least 1 quart of fluid for every 25 pounds of body weight should be given in 24 hours.[14] Normal saline or dextrose Ringer's solution is given by infusion and hypodermoclysis and saline or tap water is given by proctoclysis. After the tanned areas are hard and dry the patient is simply left without covering in the heated tent. Should suppuration develop beneath the crusts they should be opened or partially removed and the underlying area irrigated with saline—*not* boric solution. Wide areas denuded of skin will require grafting. For this purpose Thiersch or Reverdin grafts are often suitable.

In cases of severe electric shock lumbar puncture has been found to be a valuable adjunct to artificial respiration. It should be done as early as possible.

The work of de Takats, Sicard, McPheeters and others has placed on a firm basis the obliteration of varicose veins by injection of segments with a sclerosing solution. De Takats[15] employs 5 to 10 c.c. of a solution of equal parts of a 50 per cent dextrose solution and a 30 per cent solution of sodium chloride. A segment of the vein is blocked off with the fingers while the solution is injected and for two minutes afterwards. A cotton plug is then pressed against

the injected area and held firmly in place for two days. Two injections may be given at once and the treatments twice a week. An elastic bandage is worn during the time. This treatment is often combined with ambulatory ligation of the saphenous vein. De Takats[16] says that ambulatory ligation of the saphenous vein is indicated in cases where the saphenous trunk above the knee is dilated and shows marked reflux from above. If the main reflux is from the deep communicating veins, the operation is obviously useless. The ligation reduced the number of injections below the ligation.

In perfringens antitoxin we now have a weapon against gas gangrene in cases where the development of this condition is suspected.

Since the publication of Caylor's work[17] we can no longer regard the sebaceous cyst as innocuous. In Caylor's series of 236 cases, 3.4 per cent became malignant. A percentage this high should cause us to advise the excision of all sebaceous cysts.

Fractures of the clavicle are to be treated by clavicular cross splints or figure of eight braces which are on the market. While these braces and splints are being worn, care should be taken that circulation is not impaired, that the patient give adequate exercise to his arms, and that the skin beneath the brace be kept well powdered.

The Lahey operation[18] is a distinct advance in the treatment of pilonidal sinus.

The closed treatment of empyema cavities involves minor surgical procedures of careful exactitude.

Local anesthesia has had an increasing field of usefulness in minor surgery. It can be used profitably in the revision of finger injuries where a nerve block of 2 per cent novocain is injected on each side of the base of the finger. It is also used in the removal of hemorrhoids and the excision of fissures-in-ano, and in the reduction of certain fractures. For this latter purpose the nerve block method is probably superior to infiltration.

In the treatment of many fractures the molded plaster of Paris splint has superseded circular plaster casts. These splints accurately fit any shape of the extremity and are far superior to the commercial metal splints. They are made by spreading the wet plaster bandages on a flat surface to the desired length and thickness, taking care to rub the wet bandage as it is folded over on itself. This wet splint is then carefully applied to the extremity and allowed to harden in the exact shape desired.

The writer feels that the treatment of ganglions by dispersion, that is, striking with a hard object, is superior to excision and has employed it frequently. Carp and Stout[19] found fewer recurrences after disperson than after excision. Dr. J. S. Welch of Lincoln, Nebraska, successfully treats ganglions by simply transfixing them with a fine cataract knife.

The removal of tattoo marks can be successfully accomplished by the tannic acid and silver nitrate method described by Shie.[20]

In sprained knees, painfully distended with fluid, repeated aspirations will give great relief and will facilitate recovery. The aspiration is made one inch to the outer side of the patella.

The valgus felt pad in sprains of the external lateral ligament of the ankle constitutes a very valuable addition to the treatment of that condition. These tapering pads are glued inside the shoe on the same side as the injury and take off the strain from the wrenched ligament.

The splendid results in the treatment of plantar warts by radium will highly recommend that method of treatment.

In whole blood transfusions the writer has found the Scannell three-way valve apparatus to be the most generally useful. By means of this apparatus the blood of the donor is pumped directly to the vein of the recipient. A word of warning must be said against using the same donor more than once for the same recipient. The writer has seen a serious anaphylactic reaction follow such a procedure.

The writer, in closing, wishes to urge all physicians to report in the literature all original minor surgical procedures which they have found to be of use. No matter how trivial the conditions are for which the method is recommended, all patients and doctors will welcome additions and refinements of technic.

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THE ACTIVITY OF OFFICIAL PREPARATIONS OF ERGOT

Recently the conviction has grown among pharmacologists that, while undoubtedly histamine and tyramine play a part in the pharmacologic responses to ergot under laboratory conditions, they have little or nothing to do with the action of ergot as used clinically. It is generally held at present that the alkaloids are the important constituents. With the development of this belief has come naturally an insistence that preparations offered to the medical profession should contain them. In 1929 the Council on Pharmacy and Chemistry omitted from New and Non-official Remedies those preparations of ergot which, from their method of manufacture, were not likely to contain, or were not shown by proper methods of assay to contain, important amounts of alkaloids. The United States Pharmacopeia not only prescribes an efficient method of extraction in the preparation of the fluidextract, the only official preparation, but requires in addition that the preparation be assayed by a biologic method which determines the alkaloidal content. An examination of the market supply of fluidextract of ergot made in 1928 revealed only one of five to have less than the required strength. In this examination most proprietary ergot preparations were found to be altogether inactive or distinctly below the strength claimed for them. Similar results for proprietary ergot preparations, some of which are marketed in this country, have recently been reported abroad. Two investigations have recently been published that indicate that the deterioration of fluidextract of ergot does not proceed rapidly. There is no real reason why the American physician should not continue to use with confidence fluidextracts made by reputable firms in accordance with the Pharmacopeial method and shown by proper methods of assay to contain the activity required by the Pharmacopeial standard. If he uses other than official preparations, he should convince himself that the non-official preparation used actually possesses the properties characteristic of a standard ergot preparation: if it has been accepted by the Council on Pharmacy and Chemistry for New and Non-official Remedies the composition and efficiency may be depended on. (Jour. A. M. A., May 10, 1930, p. 1504.)

TUBERCULOSIS OF THE INTESTINE: ITS DIFFERENTIAL DIAGNOSIS*

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TUBERCULOSIS of the intestine readily divides itself into two main types, the ulcerative type and the hyperplastic or hypertrophic type. Certain writers have added a fibrous or sclerotic type.

In the first type mentioned, the gross pathologic changes are varied. The evolution of the tuberculous process may be seen, including formation of tubercles, caseation, ulceration and fibrosis. The earliest lesions usually begin in the solitary lymph follicles or Peyer's patches. The ulcers may begin as mere abrasions, and by the coalescence of numerous small lesions larger ulcers may result. In the typical ulcers there is marked infiltration of various tissue elements, everted edges, and considerable undermining. The floor of the ulcer may be formed by submucosa, muscularis, and is often covered with necrotic débris. On the serous side of the ulcers may appear groups of tubercles. In the small intestine, the ulcers are irregular, and eventually may encircle the bowel; in the colon the ulcers are transverse to the long axis and may girdle the bowel in ring-like fashion. The extent of disease, the rapidity of its progress, and the length of time the patient has had trouble, may be factors in variations of individual ulcers.

In the second type of intestinal tuberculosis mentioned, the essential changes seem to include proliferation of connective tissue, involving all layers of the bowel and extending completely around the intestine. The wall eventually becomes thick, and may present a fusiform enlargement, difficult to distinguish grossly from a new growth. The lumen may become narrowed until it is almost occluded before patients are impressed with their disability.

A third type of tuberculosis of the intestine, the so-called sclerotic or fibrous type, is probably secondary to extensive ulcerative lesions. Here there is great thickening of the wall of the bowel from connective tissue. The stenosis is usually circular and tends toward annular constriction. Such sclerotic regions may be multiple.

The pathogenesis of the intestinal lesions of tuberculosis remains a debated question. Goldberg and Smithies, who recently compiled a complete review of tuberculous enterocolitis, lean toward the view that the greatest number of cases originate primarily in the mucous membrane by direct contact with the infecting mass. This implies that tuberculosis is secondary to lesions elsewhere and this is usually the case. Others have emphasized the possibility of blood-borne infection. Still others have suggested infection through the peritoneal route. That the latter is rare is suggested by a review by Lemon of fifty cases of tuberculosis of the colon, in which there was tuberculous peritonitis in only ten.

The incidence and site of election of the lesions of intestinal tuberculosis have a significant bearing on its diagnosis. Osler stated that in 1,000 necropsies in cases of tuberculosis in hospitals in Munich, intestinal tuberculosis was present in 566. The lesions are most prevalent in the ileocecal coil; that is, in the terminal portion of the ileum and in the cecum. This applies to the ulcerative as well as to the hyperplastic forms. Why these regions of predilection, or of greater susceptibility, exist remains a debated point. Change in the flow of intestinal content, initiation of segmental mass and different haustral motion in the colon, or, as Brown has pointed out, cecal stasis, reversed peristalsis of the ascending colon, and the richness of the lymphoid structures in the ileocecal region, may all be factors in this localization of tuberculous lesions. At any rate, it is known that their incidence in the large intestine varies directly to their proximity to the cecum and inversely to their proximity to the rectum.

The significance of the presence of acid-fast bacilli in the stools often has been over-rated. Various authors have noted acid-fast bacilli in the stools of 90 per cent of the patients with pulmonary tuberculosis, of whom only 5 to 10

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Trudeau Medical Society, Rochester, Minnesota, March 29, 1930, and before the Philadelphia County Medical Society, Philadelphia, May 1, 1930.

per cent had intestinal lesions. Furthermore, other acid-fast organisms, such as *Bacillus smegma* and various saprophytes, may take the acid-fast stain.

The symptoms of the well advanced cases of ulcerative or hyperplastic tuberculosis are usually



Fig. 1. Filling defect caused by pericecal lesion.

marked but rarely diagnostic. In the earlier cases they are difficult to appreciate.

In the hypertrophic type, associated pulmonary disease is often not demonstrable, although careful search of roentgenograms usually will reveal an old lesion. In such cases, ulcera tion is not a feature and the first symptoms noted are usually those of beginning or chronic obstruction. Not infrequently the patient complains first of palpable tumor, usually in the ileocecal region. Borborygmus may be present; later, nausea, colicky pains, and days of watery stools alternating with days of great difficulty in obtaining satisfactory evacuation of the bowel may occur. The roentgenogram may reveal a filling defect, not unlike that of a malignant lesion, but its large size, the general well-being of the patient, his age, and the absence of blood in the stools often will lend clues to the diagnosis. Clinically, however, accurate differentiation of a malignant lesion and of hyperplastic tuberculosis often is not possible, and surgical intervention will be necessary to establish the diagnosis. Differential diagnosis rests primarily between the hyperplastic form of tuberculosis, malignancy, actinomycosis, and the nontuberculous pyogenic type of granuloma previously reported.[2] In this granuloma there is often a history of appendicitis with perforation or of other perityphlitic inflammatory disease (Fig. 1).

The diagnosis of the ulcerative form of tuberculosis presents a much more widely diversified problem. The symptoms are often vague and varied. Pain may be periodic or constant; it may be worse after eating and may be referred to the epigastrium. Occasionally it will be severe and cramp-like, or it may be dull and constant. Frequency and severity of gas pains may increase with the advancement of the disease. Pain may be markedly relieved by movement of the bowels. Distress after eating, so-called indigestion, and hyperacidity, gas, nausea, and vomiting are frequently noted. The abdomen may have a "doughy" feel, and tenderness along the line of the colon is not uncommon. Progressive loss of weight is common. Diarrhea and constipation often appear alternately, each persisting for several days or weeks at a time. However, if lesions are extensive, diarrhea usually persists. The stools are usually profuse, thin, and watery. Grossly visible blood is usually absent.

When lesions involve the large intestine to and including the rectum, the proctoscope usually discloses a characteristic picture. The ulcers are ragged, irregular, large, with indurated edges and overhanging margins, and with patches of normal mucous membrane between the lesions. However, too often, the lesions do not involve the rectum and sigmoid portion, so that the roentgenogram offers the most important diagnostic aid.

In a paper entitled "Diseases of the large intestine"[1] appears a typical roentgenogram of an ulcerative type of tuberculosis. The most extensive deformity appears in the cecum and ascending colon. Irregular involvement of the mucosa becomes reduced as the left side of the colon is approached. There is not the immense thickening of the wall, so characteristic of chronic ulcerative colitis, and a tendency toward the maintenance of haustra persists. Writhing and rapid emptying and filling of the ileocecal coil is seen under the fluoroscope. The finding of a distant

tuberculous focus often clinches the diagnosis.

When the diagnosis rests between a regional type of chronic ulcerative colitis or amebic ulceration, the therapeutic test often will help to settle the difficulty.

The five common conditions that cause differential difficulties include amebic ulceration, chronic ulcerative colitis, diverticulitis, polyposis, and malignant disease. Except in the rare cases of bleeding, little difficulty will be encountered in distinguishing diverticulitis from other conditions, and here the roentgenogram usually will establish the diagnosis. Again, in the clear-cut case of chronic ulcerative colitis, no difficulty should be encountered. The typical proctoscopic picture, with diffuse involvement of the mucous membrane, myriads of minute ulcers, granular, easily bleeding mucous membrane, and the characteristic roentgenogram of a foreshortened, narrowed, nonhaustrated colon cannot be confused with any other form of ulceration of the colon. There is, however, a form of chronic ulcerative colitis in which parts of the large intestine other than the rectum are involved. This affords the greatest diagnostic difficulties[3] (Fig. 2). Although chronic ulcerative colitis usually begins in the rectum, it may attack all or any portion of the large intestine. Whatever segment is affected by the disease, the roentgenologic picture is essentially the same, but when a portion of the right side of the colon is affected, difficulties may arise. However, the only real similarity between this form of chronic ulcerative colitis and tuberculosis is usually that the site of involvement may be the same. In ulcerative colitis, the colon is narrowed, and there is often abrupt change from diseased to normal bowel. The absence of tuberculous foci elsewhere in the body, the length of the history, the occurrence of exacerbations and remissions, the presence of blood in the stools, and finally, the therapeutic test with the chronic ulcerative colitis serum usually help to clear the diagnosis. Occasionally, however, exploration is necessary to establish it.

Amebic ulceration may afford a real diagnostic difficulty. First, both amebiasis and intestinal tuberculosis have the cecum as their site of predilection. A patient with severe amebic ulceration may be just as sick as one with advanced intestinal tuberculosis. However, if amebiasis is present, the patient will pass large amounts of blood in the stool. Furthermore, he is less likely than the tuberculous patient to have stools at night. The tendency is rather to be free from stools at night. In cases of amebiasis the proctoscope usually will disclose characteristic, punched-out ulcers, covered by a fleck of

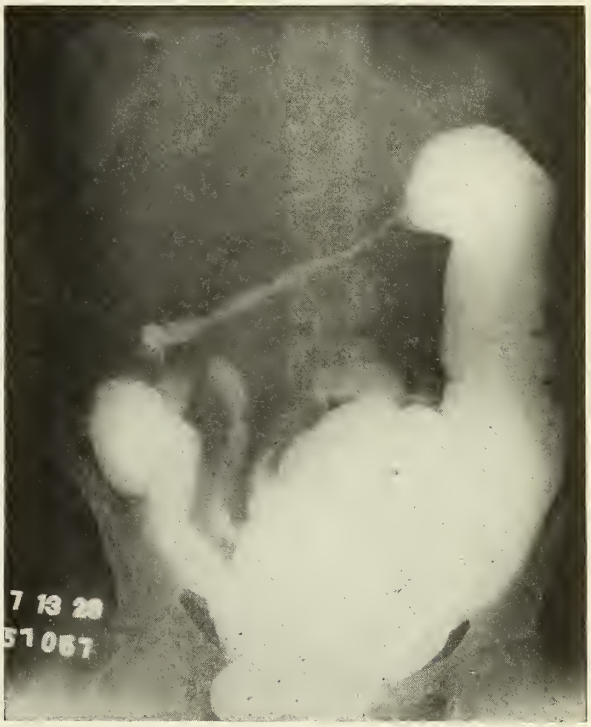


Fig. 2. The narrowed, nonhaustrated transverse colon after the barium enema.

mucus, with a hyperemic surrounding zone, and between ulcers normal mucous membrane. But in cases of advanced, extensive disease, when ulcers have coalesced to form large sloughing bases, the proctoscope alone will not suffice. The roentgenographic appearance is not often characteristic, but in some cases of amebic ulceration, positive roentgenologic diagnosis can be made. The lesions characteristically involve the right side of the colon, and present a picture resembling in some respects the involvement by chronic ulcerative colitis, but less extensive. The therapeutic test with emetine and arsenic will aid in the diagnosis. However, finding of the *Endamœba histolytica* in the stool or in scrapings from the ulcers will establish it.

The history in cases of polyposis can readily be confused with the history of a case of tuberculosis. This is particularly true because both diseases are likely to attack young persons, and because in both there is often a history of dis-

ability of long standing. Here again the proctoscope and the roentgenogram will help to clarify the diagnosis.

Malignant disease need only rarely present difficulties of diagnosis. The usual history of onset with rectal bleeding, relatively rapid progression, signs of obstruction in persons past middle life, without a demonstrable tuberculous focus, usually readily establishes the character of the trouble if malignancy is present. However, there are instances in which real difficulties arise. Cases are occasionally seen in which two lesions coexist. A case in point is briefly mentioned.

A man, aged sixty years, came to the clinic in February, 1930, with a history of pulmonary disease of fifteen years' duration, with cough, and purulent sputum, which contained large numbers of acid-fast bacilli. For a year he had experienced slight difficulty in moving the bowels, with some straining and rectal bleeding. A proctoscopic examination was negative for 24 cm. of the bowel examined. A roentgenogram of the thorax revealed evidence of active pulmonary tuberculosis; one of the colon disclosed a filling defect of the sigmoid (Fig. 3). The lesion was thought to be malignant but exploration was necessary to establish this fact.

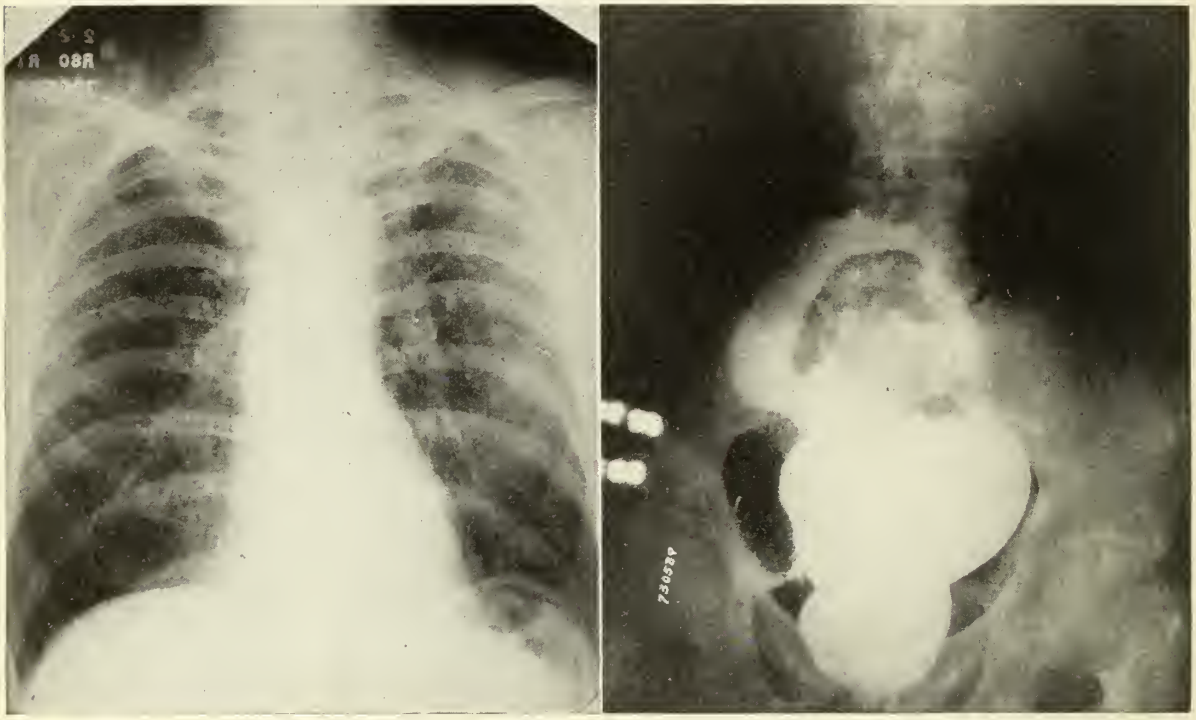


Fig. 3. *a*, The thorax of a patient with active pulmonary tuberculosis and carcinoma of the sigmoid; *b*, obstructive filling defect in the sigmoid is shown.

COMMENT AND SUMMARY

The lesions of greatest significance in making a differential diagnosis in cases of tuberculosis of the large intestine divide themselves according to the type of tuberculosis with which one is dealing. The hyperplastic type must be distinguished from malignant disease, actinomycosis, pyogenic pericecal or ligneous reaction, causing cecal deformiity, localized diverticulosis, and other benign cecal and pericecal lesions. No stress has been laid on lesions like the cholesteatoma because of their rarity, nor on renal or other intra-abdominal lesions because this study is concerned with the differentiation of lesions intrinsic in the large intestine.

The ulcerative type must be distinguished from malignant disease, diverticulitis, polyposis, amebic ulceration, and chronic ulcerative colitis.

Amebic ulceration, and the regional or migratory type of chronic ulcerative colitis, present the greatest differential difficulties.

Gross examination of the stools with the naked eye gives valuable information about the various ulcerative forms of disease of the colon. The

proctoscope and the roentgenogram are the most valuable diagnostic aids.

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THE PHARMACOPEIAL CONVENTION

At the recently held Pharmacopeial Convention in Washington, the delegates with commercial interests far outnumbered those from the medical profession. For the interests that opposed medical control of therapeutics, leadership was assumed by Henry H. Rusby, the "sacred cow" of certain druggists. Rusby was testifier for the Wine of Cardui Company in its suit against the American Medical Association, a testifier for a firm against which the Post Office issued a fraud order, a testimonial producer for the Fleischmann Company, and he has been the chief supporter of Ambruster, importer of Spanish ergot, in his attacks on the Food and Drugs Department. At the previous convention an agreement was reached that the scope of the Pharmacopeia, at least so far as concerned therapeutic usefulness, be determined by the medical members of the Revision Committee and that questions of pharmaceutic necessity be determined by the pharmaceutic members. At the present convention, Torald Sollmann offered a motion to instruct the Committee on Revision to charge the medical members with the responsibility of final decisions in the selection of products of therapeutic usefulness. This motion was not adopted, instead it was decided that a two-thirds vote of the Revision Committee would finally settle the question of inclusion of any article. Since the pharmaceutical interests far outnumber the medical representation, this means that pharmacists will determine the admission of drugs to the Pharmacopeia. It is clear that the U. S. Pharmacopeia is confronted with an epoch of degeneration against which the medical and scientific members of the Revision Committee are likely to fight a losing battle. The present organization of the U. S. Pharmacopeial convention is undemocratic and unscientific. Unless some scientific plan for the revision of the Pharmacopeia is adopted, it may be necessary to advocate government control of the entire matter. (Jour. A. M. A., May 24, 1930, p. 1707.)

TUBERCULIDS*

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TUBERCULIDS represent true tuberculous lesions of the skin. They are the result of periodic bacillemia; in the wider sense of the term, they represent an embolic obstruction of the peripheral vessels of the skin and subcutaneous tissue, the embolus or emboli arising from a deeper seated focus, usually the lymph nodes, but also the bones, intestines, and so forth. Strikingly active pulmonary tuberculosis is rarely present. Tuberculids are found in individuals with relatively high immunity quotients. Bacilli can be found in the lesions only very early; they are promptly destroyed by the defense mechanism. It is, therefore, not practical to try a search for the bacilli of tuberculosis by the usual laboratory methods, as they are not likely to be found. Individual lesions heal readily, only to be followed by new lesions periodically.

Tuberculids, therefore, represent etiologically the same but genetically quite a different lesion of the skin from tuberculous conditions of the skin such as lupus vulgaris, scrofuloderma, and tuberculosis verrucosa cutis. The latter spread by peripheral extension only, occasionally being propelled rapidly along the lymphatics. The bacilli are rather readily demonstrated in the tissues, and the evidence points to lack of specific allergy in the patient.

Tuberculids are probably of greatest significance because of their diagnostic value. In a case in which systemic symptoms are obscure, it may require their presence to reach a final diagnosis. They mean active although chronic tu-



Fig. 1. Lichen scrofulosorum.



Fig. 2. Acnitis.

*From the Section on Dermatology and Syphilology, the Mayo Clinic, Rochester, Minnesota. Read before the Minnesota Trudeau Society, Rochester, Minnesota, March 29, 1930.

berculosis. Cases are not uncommonly seen with frequent headaches, malaise, and vague pains, asthenia, lack of endurance, possibly obscure fever, or a syndrome that subjects the patient to suspicion of malingering. Patients often have a good color and they may be overweight. In such cases, diagnosis may be utterly impossible without the lesions of the skin. The symptoms of a systemic character probably represent intoxication from a deep-seated focus.

Tuberculids appear in the skin in varied morphologic forms. According to these, they have been classified; the terminology employed to designate various clinical manifestations is descriptive of their morphology.

The more common forms are called lichen scrofulosorum, papulonecrotic tuberculids, and tuberculosis cutis indurative. The genetic mechanism in all these lesions is probably the same, the morphologic manifestation being determined by the grade of immunity, the anatomic structure involved, the pattern of the individual skin reaction, and possibly other factors as yet unknown.

Lichen scrofulosorum appears as grouped,



Fig. 3. Follicli.

acuminate, follicular papules (Fig. 1). Papulonecrotic tuberculids are slightly inflammatory papules with a definite necrotic center, which can readily be picked out, leaving a crateriform de-



Fig. 4. Erythema induratum, ulcerative type.



Fig. 5. Erythema induratum, nonulcerative type.

pression. When confined to the face they are spoken of as acnitis (Fig. 2) and when confined to the fingers as folliclis (Fig. 3). Erythema induratum, both the ulcerative and nonulcerative type (Figs. 4 and 5), might be looked on as a papulonecrotic tuberclid, or as belonging to the



Fig. 6. Lupus pernio; distinction of lesions with involvement of fingers is shown.

indurative group. It has features of both and represents essentially a transitional group. One would expect such morphologic manifestations from what has been said. In the indurative group, I place the lesions formerly called the Boeck and Darier Roussy sarcoids, and true lupus pernio (Fig. 6). The Spiegler-Fendt type of sarcoid is no longer believed to be caused by the bacillus of tuberculosis but is placed with the lymphoblastomas. Sarcoids appear as brownish-gray to purplish infiltrations varying in size from a small papule as seen in the small miliary type of Boeck's sarcoid to large plaques, as seen in lupus pernio. Ususally a brownish nodule similar to that seen in lupus vulgaris may be elicited with the diascope. In lupus pernio there may be some telangiectasia. The histopathologic picture may be specific or nonspecific and may therefore be of much or of little aid in diagnosis. When the infiltrate is specific it consists of small whorls in the cutis with definite involvement of the subcuticular fat (Wucheratrophie). The individual whorls are sharply defined by connective tissue strands which in the center consist of epithelioid cells surrounded by a halo of lymphocytes associated with an occasional giant cell. Sarcoids may be closely simulated by syphilis, leprosy, the lymphoblastomas, and even certain septic processes and trichophytosis. It goes without further comment, therefore, that diagnosis must not be determined by inspection alone. A careful investigation is necessary. The indurative tuberculous lesions of the skin are fairly often associated with characteristic systemic changes. It is probable that the latter represent the same type of infiltration in other organs as that seen in the skin. Particularly striking are the distinct nodular infiltrations in the periphery of the lungs. These simulate rather closely malignant metastatic infiltrations. Infiltration about the hilum is not characteristic in this relation. Infiltration into the bones, referred to as fibrocystic changes and by various other names, and in this instance part of a syndome of tuberculosis, is a part of the picture, and search for it should always be made. In such cases there may be splenomegaly and tenderness over the splenic area. Sometimes a glandular syndrome resembling closely so-called Mikulicz's disease is seen. The patient may have a variety of other systemic and even objective complaints. Not all of these changes, however, are found in a given case. Without a proper interpretation of any possible lesions of the skin, the nature of the condition is hardly clear. Treatment resolves itself into the treatment of tuberculosis. I doubt if any local measures I have used, including roentgen rays and radium, are of any value.

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ACUTE PERFORATED PEPTIC ULCER*

A REVIEW OF 53 OPERATED CASES

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I THOUGHT it might be interesting, and possibly of value, to review some of the cases of acute perforation of gastric and duodenal ulcers which have occurred in recent years at the Minneapolis General and the University of Minnesota Hospitals, and, accordingly, have examined the available records and studied fifty-three cases. Forty-two of these are taken from the records of the Minneapolis General Hospital from the year 1920 to 1930, and eleven from the records of the University of Minnesota Hospital from the year 1924 to 1930. Only those records of the acute perforations were examined, and no notice was taken of the records of the so-called chronic or slow perforating type. In each case the diagnosis was confirmed by operation and the operation itself was undertaken by various members (one being myself) of the surgical staffs of these hospitals.

It is not within the scope of this paper to dwell with any detail upon the various phases of the subject matter, since such have been covered frequently and thoroughly by extensive clinical studies in a voluminous and abounding literature. I have, however, tried to follow up the end results in all of these cases in so far as I was able, but found it very difficult to locate any considerable percentage of the patients who belonged to a floating population, or to get the coöperation of the remainder.

Collins[1] reports finding 181 perforations out of 262 cases of duodenal ulcers examined at postmortem, and Finney[2] says that perforation is responsible for 7 per cent of deaths found at autopsy. Relative to the matter of frequency of reported cases, however, authorities vary in their statistics. Welch[1] reports 6.5 per cent; Burton,[1] 13 per cent; Deaver,[3] 20 per cent; Musser,[1] 28.1 per cent; Finney,[2] 28.1 per cent; and Fenwick,[1] 28.5 per cent. Interesting, also, is the fact that such perforations occur more frequently in some countries than in others. In a recent communication, Archibald Young,[4] Regius Professor of Surgery at the University of Glasgow, writes me: "We certainly see a very large number of cases of perforation of the stomach and duodenum in my clinic, and the same is true of the clinics of my colleagues. I think it quite certain that perforations occur here more frequently than in many other parts of the world and even in many centers of similar industrial activity to this. Many occasions have occurred where we have had to deal with two, three, or four perforations in one day, and we seldom have many receiving days without a certain number of cases of perforation. What the reason for this greater frequency of perforation is, it is difficult to say." Trout[5] also found an unusually high incidence of acute perforations of peptic ulcers among soldiers in Hawaii, and from his study concluded that peptic ulcer occurs half as frequently among white soldiers in Hawaii, and perforations four times as frequently as among enlisted men of the army, serving in the United States.

In this series of 53 cases, I find fifty-one (or 96.4 per cent) occurring in males. This is in full accord with the statistics of other observers. Brown,[6] in a study of 100 cases, found ninety-five to be among males; Dineen,[7] out of 142 patients, found 138 males; Guilleminet,[8] in forty cases, all males; and Urrutra,[9] reporting fifty-two cases, found the proportion to be 94 per cent males, as did Fermaud[10] in his series.

TABLE I
AGE OF PATIENTS

Under 20	20 to 29	30 to 39	40 to 49	50 to 59	Over 60
1	13	17	11	10	1

The youngest in this series was nineteen and the oldest sixty-six years of age, the average being thirty-seven years. This average also agrees with the statistics of other men, who claim that the largest number of cases occur in the third decade. Wise[1] claims no age, from earliest infancy to extreme old age, is spared.

*Thesis read before the Minnesota Academy of Medicine, at its meeting of April 9, 1930.

Twenty-two per cent of this series were foreign born. In their occupations there was a great deal of variety, although 32 per cent were classed as laborers.

The immediate cause of perforation is not known and, according to Moynihan,[11] not easy to discover. The solution undoubtedly lies in the discovery of the etiology of the ulcer itself. To those interested in the experimental phase of this subject, I would recommend reading the thorough article recently published by McCann.[12] It would seem logical to suppose, and as has been frequently quoted, that in the majority, the tissues at the site of the ulcer become so weakened that they are unable to continue their normal physiological function and, as a result, perforation takes place. Wilensky's[13] theory of embolic phenomena, and Sippy's[14] six factors, bearing on the cause of perforation, have been so frequently mentioned that they are undoubtedly familiar to you. Just as in other series of acute perforations of this type, so in this series, perforation followed straining, excessive drinking, occurred at work or rest, before meals, after a full or heavy meal, in the midst of sleep, and, in fact, anywhere and at any time. Two of this group had a perforation develop while each was in a hospital undergoing examinations by their physician preparatory to arriving at a diagnosis. Olson[15] is convinced that an upper respiratory tract infection, an acute outbreak of oral sepsis, a mild bacteremia, or a toxemia of any sort has a very definite relationship as a predisposing factor in an acute perforation. Colp[16] believes that a sudden physical effort and distention of the stomach are potent factors in producing a sudden perforation of a penetrating ulcer.

In this connection I should like to refer to one of the supposedly predisposing factors, namely, the use of the routine barium meal as used in fluoroscopy and *x*-ray examinations of gastrointestinal cases. Thus Eckman[17] reports five cases where an acute perforation of a peptic ulcer followed the routine use of the barium meal as ordinarily used in fluoroscopy and *x*-ray examination of these cases. More recently others have reported cases, and I myself had occasion to operate upon such a case, in a private patient, within a few hours following the completion of such an examination. Whether these facts are simply a coincidence, or whether these perforations, following the ingestion of the barium meal, follow only in ulcers of the penetrating type, or whether or not the barium meal is really a predisposing factor, I am unable to say. In any event, it has occurred and has been reported frequently enough to warrant a close observation of the patient by his physician following such an examination, until the immediate danger of an acute perforation is passed. As a matter of interest, it might be mentioned that Powers[18] reports four cases of acute perforation resulting directly from extreme trauma.

In a small number of cases, the onset of the acute perforation is the first definite indication of the presence of a peptic ulcer. This, according to Deaver[3] and others, is not the rule, however, as 90 per cent have a previous ulcer history. It must be distinctly borne in mind that the duration of the symptoms, as related by the patients upon their hospital admittance, when they are suffering acutely and are somewhat bewildered, is only more or less accurate. In this group, I find there were twelve patients who, according to their hospital records, denied ever having had any previous gastric disturbance or distress (Table II); five who had suffered only for one month or less; three who had suffered only within a period of six months; three for one year; five for two years; five for three years; one for four years; one for five years; and sixteen for over a five-year period; the longest one of whom suffered for twenty years. In two cases no time period was stated.

Thus, in this series, 75 per cent gave a history of gastric disturbances prior to the onset of the perforation. In Colp's[16] series of twenty cases, 90 per cent gave a history of previous gastric disturbance, one-third of these giving such a history of from five to twelve years' standing. In Henry's[19] series of twenty-five cases, 84 per cent had a history of gastric disturbance, "indigestion," "dyspepsia," etc., extending over months or years.

The acute symptoms were very sudden in 96 per cent of these cases, and, as previously stated, occurred with no relation either as to time, method, or place. In every instance the very sudden and acute pain, described by some as knife-like, by others as cramp-like, stabbing, violent, agonizing and so severe as to double them up, is the first, the most outstanding, the most important and severest subjective sign or symptom. Morphin is said to have little or almost

TABLE II

DURATION OF ACUTE AND CHRONIC SYMPTOMS BEFORE OPERATION WITH OUTCOME

Duration of Acute Symptoms Before Operation		None	Duration of Chronic Symptoms Before Operation																			Not Stated	Total
			Weeks				Months											Years							
			1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	over		
Under 12 Hrs.	L	8	1	1		1					1	1						2	4	3	1	1	12		36
	D			2														1	1	1					5
12 to 24 Hrs.	L							1																	1
	D	1																					1	1	3
24 to 36 Hrs.	L																								
	D	1																							1
36 to 48 Hrs.	L																								
	D																							1	1
4 days	L																			1					1
	D	1																							1
7 days	L																								
	D																						1		1
Over 7 days	L																						1		1
	D																						1		1
Not stated	L																								
	D	1																							1

no effect in relieving the pain, which can only be likened, in its acuteness and severity, to the similar one of acute pancreatitis. In this series, the pain was referred to the epigastric region in 36 per cent, more or less vaguely without direct reference to any specific locality, to the abdomen in 58 per cent, and to the umbilical region in 7 per cent. Gibson[20] stresses referred pain, especially to some portion of the neck, chest, or shoulders, as an important secondary symptom. According to our records, in this series I did not find such radiation of pain a consistent or constant sign. It may not have been diligently sought by those responsible for the examination of the patient. In two cases pain was referred to the right shoulder; in another two, to the left; in two others, to the lower right abdominal quadrant; in one, to the back; and in one, simply to the right side of the abdomen. Nor did the records show vomiting or nausea to be constant or characteristic signs or symptoms of these perforations. They were, however, recorded in about 40 per cent of the cases, which agrees with the statistics of others, who also state that these symptoms are without much significance, in so far as a diagnosis of perforation goes.

Collapse or prostration was recorded four times in this series. Surgical shock was not recorded, nor have I myself ever seen it in these cases. Moynihan[11] denies that shock is ever present, and Brewer[21] believes the symptom greatly over-emphasized. Deaver[3] reiterates that a low blood pressure, apathy, or a change in the pulse rate are rarely seen in these cases. I agree with Olson[15] that the term is loosely used and, in reference to these cases, should be discarded. The average pulse rate of the patients in this series, as disclosed upon their hospital entrance, was 90; the temperature 98.8°; and the respirations averaged 28 per minute.

Following the sudden onset of pain, the pulse rate remains unchanged or is slightly lower, the temperature remains normal or unchanged if slightly subnormal, while the respiration becomes shallow, of the thoracic type, and increased in frequency. Such patients prefer to be quiet, motionless, with their knees flexed, while the abdomen takes on a scaphoid appearance and

becomes inflexible and rigid to a degree commonly known as "board-like." This so-called "board-like" abdominal rigidity is the chief, most characteristic and most important physical sign of a perforation. It usually is spread well over the abdomen, although it may be localized more or less definitely in the epigastric region or over the upper half of the abdomen. Hand in hand with abdominal rigidity, goes an extreme abdominal tenderness. In this series, these signs were invariably and almost constantly present. The tenderness may, however, also shift to various abdominal regions, not infrequently radiating or localizing in the lower right quadrant as in cases of acute appendicitis. Tenderness, like rigidity, is an early symptom. Obliteration of liver dullness on percussion is a sign frequently mentioned, but less frequently found. Our records report its presence in three cases. In by far the large majority, it was not mentioned nor recorded. Colp[16] believes that the obliteration of liver dullness, when present, is pathognomonic of intraperitoneal perforation, but emphasizes that it must not be confused with tympany occasioned by a distended colon, and adds that if liver dullness is percussed in the mid-axillary line this error will not occur. Gibson[20] says that the obliteration of liver dullness should not be considered positive unless a layer of air can be percussed over the liver, posteriorly.

Leukocytosis is the rule and makes its appearance early, following the onset of pain. The average count as recorded in this series was 15,000, with a correspondingly increased polymorphonuclear count. The differential leukocyte count, according to Gibson,[20] is of no assistance.

As the condition progresses, without proper treatment, a reaction sets in, during which time the patient may think and say that he feels improved. This stage is called the transitional stage, or the passing on to true peritonitis with its accompanying symptoms. If, now, a patient is seen for the first time by his physician, the diagnosis becomes more confusing, especially in so far as acute appendicitis with progressive peritonitis is concerned.

If the case is seen early, the diagnosis usually presents no difficulty. The history of the very acute onset, the extreme pain, the board-like rigidity and tenderness of the abdomen, the unchanged pulse rate with absence of shock, readily point toward the diagnosis of an acute abdomen, most likely a perforated ulcer. House surgeons and interns frequently recognize and diagnose the condition correctly before the Staff surgeon is called to see the patient. In this series, thirty-eight, or over 70 per cent, were correctly diagnosed pre-operatively. Two were diagnosed as perforated viscus, another two as acute abdomen, one as acute perforated ulcer or acute pancreatitis, two as acute perforated ulcer or acute appendicitis, and three as acute appendicitis. In five cases no pre-operative diagnosis was recorded.

Recently Vigyzao[22] mentioned the presence of subcutaneous emphysema as diagnostic of perforated ulcer. Such emphysema, he claims, is usually localized in the umbilical or cecal region. According to Wolfson and Gray,[23] this finding has been corroborated by Podlaha, who reports also emphysema of the supraclavicular spaces. Personally, I am unfamiliar with this sign and have found very little reference to it in the literature.

Where, for any reason, the case seems complicated or the diagnosis difficult, the use of fluoroscopy is recommended. Vaughan and Singer[24] refer to the early diagnosis or recognition of acute perforations of ulcers, with the *x*-ray of spontaneous pneumoperitoneum. In fifty-four of their sixty-three cases it was easily demonstrated. The free gas has been seen as early as two hours following the perforation. A small quantity is sufficient for its demonstration. The presence of free air is shown distinctly as a bright zone which shifts on change of position, being most typical when the patient is in an upright position. The sign is of great value and, when found, is considered by some as being pathognomonic. In four cases of this series, this method was used and the diagnosis confirmed at operation.

Because of the time necessarily involved in making preparations for the use of this diagnostic method in these emergency cases, and because in most cases the diagnosis can be made without it, I do not recommend the procedure as a routine measure in every case, nor would I say that the absence of the gas bubble in such an examination was a positive proof that the perforation did not exist.

At times the differential diagnosis of ruptured ulcer presents difficulties. The conditions most frequently encountered, or which must be con-

sidered, are acute perforated appendicitis, acute pancreatitis, acute cholecystitis, diaphragmatic pleurisy, intestinal obstruction, coronary thrombosis, tabetic crises, mesenteric thrombosis, and renal colic. Geier[25] has already pointed out that acute appendicitis offers the most difficult point in diagnosis and refers to Moynihan's[11] report of forty-nine cases, in eighteen of which the incision was made directly over the appendix after the diagnosis of appendicitis had been made.

Even at operation the pyloric vein cannot always be positively identified, so that differentiation between a gastric or duodenal perforation in these cases is uncertain. In this group, the large majority of the perforations occurred on the anterior surfaces of the duodenum and stomach, and within an inch or an inch and a half of the pyloric ring. They were, for the most part, of the characteristic type, being round, single, resembling a punched-out hole or opening of small size, and found usually at the bottom of the ulcer, the base of which was indurated. Adhesions, if present, were thin and of recent origin. Twenty-seven, or about 50 per cent, were recorded as duodenal, and twenty-one, or 40 per cent, as gastric. Four were classed as gastroduodenal, being found at the junction, and one, classed as jejunal, was found one inch distal to a previous gastroenterostomy. In two cases the perforation was found on the posterior wall of the stomach; in another, near the cardia; and in still another, about 3 inches from the pylorus over the fundus of the stomach. The presence and amount of free fluid was dependent upon adhesions walling off the perforation, or an active peritonitis.

I shall not attempt any description of the pathology of these perforations, nor of the pathology attendant upon them, but should like to call attention to the fact that in no less than 20 per cent of these cases the perforations are of the multiple type, and also that one and the same individual may have repeated perforations of peptic ulcers. Such a case occurred in one of this series (632, M.G.H. 1928), a male patient, who, within a period of five years, had three distinct attacks of acute ulcer perforations. The first occurred in an ulcer on the lesser curvature proximal to the pylorus; the second, post-pyloric; and the third was jejunal. Recovery in each instance, following operation, was uneventful. The case is reported in detail by Ehrlich.[26] Likewise Henry[27] reports the case of a male patient who, within a period of four years, had five distinct perforations, with recovery. Two of these were reported as gastric, two jejunal, and one not stated. Mason and Simon,[28] reviewing the literature, have been able to find records of thirty-two authentic cases of the association of two or more perforations in the same or different ulcers. Mikulicz[28] reported the first instance of this kind occurring 9 years after the first repair of a perforated gastric ulcer. The patient died and autopsy revealed a second undiscovered perforation on the posterior wall. They also state that in Vianny's[28] case there were found three perforations close together near the pylorus; and in one of Brentano's[28] cases there were four perforations, also close together on the lesser curvature. In twelve cases the sites of the perforations were symmetrically placed, one on each wall and exactly opposite each other. I mention these cases because, as the authors state, unfortunately it is rarely at operation and usually at necropsy that the diagnosis of multiple lesions has been made. Therefore, in cases of perforated gastric ulcers, both walls should be thoroughly examined at the time of the operation, a fact previously stressed by Eliott.[29]

As before mentioned, the treatment of the cases recorded in this series was given over to the various members of the surgical staffs of these hospitals. The choice of anesthetic, method of procedure pre- and post-operatively, and the steps of surgical technic were, in each instance, left entirely to the judgment of the surgeon. I find that there are recorded, in this series, twenty-three cases, or 43 per cent, in whom a simple closure of the perforation, with or without reinforcement of an omental tag or its equivalent, was performed; thirteen, or 24.5 per cent, in whom a simple closure plus a gastroenterostomy was performed; three cases in which cauterization with an actual cautery, followed by a closure of the perforation, was done; two in whom cauterization, followed by gastroenterostomy, was recorded; four in whom an excision of the ulcer with simple closure was performed; two in whom excision of the ulcer, followed by gastroenterostomy, was performed; one in whom a gastric resection was made; four who had some form of pyloroplasty, with ulcer excision; and one in whom the cautery and pyloroplasty were both used.

TABLE III

TYPES OF OPERATIONS; INTERVAL BETWEEN ONSET AND OPERATION

	Hours		Days																
	Under 12	12 to 24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Over	Not Stated	Total
Simple Closure	18	2		2								1							23
Simple Closure plus Gastroenterostomy	8	2																3	13
Cauterization and Closure		1				1												1	3
Cauterization plus Gastroenterostomy	1				1														2
Excision of Ulcer and Closure	3	1																	4
Excision of Ulcer and Gastroenterostomy	2																		2
Gastric Resection	1																		1
Pyloroplasty with Excision of Ulcer	4																		4
Cautery and Pyloroplasty	1																		1

Just as in the surgical treatment of chronic peptic ulcers, so in the surgical treatment of acute perforation of the same, a wide divergence of opinion still exists except, of course, that cases of acute perforation are emergency surgical cases and should be, as they were in this series, operated upon as soon as practical. Pyloroplasty, in duodenal perforations, is being used with greater frequency. Gastric resection is used in some clinics, in Europe especially, but in my opinion is too formidable, shock-producing, and time-consuming an operation to be used in cases of acute perforation. Excision of gastric ulcers in these cases also is more time-consuming, and means the closing of a larger opening. We should not forget that these are emergency cases and that the time element is of the very greatest importance. In my opinion no set type of operation, unless it be simple closure of the perforation, should be used routinely in any given case. I agree with Colp,[16] who says the treatment of these cases should be the simplest, least time-consuming, and least shock-producing; and with Young,[30] who voices the same sentiment in these words: "That procedure is the best and, for the patient, the safest, which is simplest, most expeditious, most easily and conveniently applied, remembering always that the operation is being done on a patient whose margin of reserve is probably at its lowest." For these reasons he believes, and I hold to the same opinion, that the surgeon should rest content with simple invagination of the ulcer and the covering in of the vaginated area in the most effective manner which the circumstances of the case permit. That a closure of the perforation is the first and most important step in the surgical treatment of the perforation, is undebatable. Whether or not to add the operation of a gastroenterostomy, is still a much unsettled and debated point.

Those favoring gastroenterostomy in addition to simple suture of the perforated ulcer, give as their reasons:

1. That perforation alone does not cure the ulcer, in a large number of cases.
2. That the mortality rate is not affected in properly chosen cases.
3. That the danger of spreading infection is

theoretical rather than of practical importance.

4. That while the gastroenterostomy is not always successful in relieving symptoms or preventing complications, it is so in such a large number of cases that there can no longer be any doubt of its specific effect.

5. That the suture always narrows the lumen and that the gastroenterostomy safeguards against secondary perforations and subsequent stenosis.

6. That, while subsequent jejunal ulcers are a possibility to be recognized, their incidence is extremely low.

To which the objectors of the additional operation of gastroenterostomy reply:

1. That the operation of gastroenterostomy is unnecessary, the perforation itself curing the ulcer.

2. That it adds to the mortality.

3. That there is danger of spreading infection in the peritoneal cavity.

4. That the operation of gastroenterostomy is not satisfactory in 100 per cent of the cases.

5. That reperforation, hemorrhage, and stenosis are exceptional sequelæ.

6. That gastroenterostomy may be followed by jejunal ulcers.

In cases of gastric ulcer perforations, Deaver[3] still believes in adding gastroenterostomy to the closure of the perforation. Moynihan[11] uses it only when he believes that a condition, such as pyloric obstruction, demands it. This, he says, has been his custom, as it has always seemed advisable to limit the length of the operation to the minimum, and furthermore, in his opinion, cases with simple closure of the perforation have done as well or even better than those in which gastroenterostomy was added. Gibson[20] does the same, closing the perforation and adding gastroenterostomy only when obvious stenosis is present. Farr[31] argues against gastroenterostomy. Wilkensky[13] believes in simple closure during the emergency, reserving other procedures as deemed best in case labor symptoms warrant reopening the abdomen. Young[4] and his colleagues are satisfied as a rule with a simple suture or, as they call it, an invagination. Their immediate results have been very satisfactory and Young states that in many cases where the location of the perforated ulcer was such as to suggest a likelihood of recurrence of symptoms or the development of pyloric stenosis, neither occurred. In this observation he suggests that we have a valuable indication afforded by nature toward a simplification of the treatment of these cases. My own opinion, based on a comparatively small and limited experience, agrees entirely with the above surgeons, and more especially with Brenner,[32] who believes that simple closure should be performed and adds that a good practical rule is,—when in doubt, do not perform a gastroenterostomy; it can be performed later if necessary.

Drainage of the abdominal cavity is a matter of choice, or judgment and experience. One gathers from the literature and from conversation with experienced surgeons that less and less heed is given to this part of the treatment than previously. Where careful aspiration has been performed there is, in my opinion, little need for drains. Young[30] prefers to use local drainage, having, as he says, a strong conviction that by so doing he minimizes the risk of pulmonary complications.

In this series, out of thirty-one cases in which drainage was used, twenty-four improved and seven died; in eight cases where no drains were used, seven improved and one died; and in fourteen cases in which no record was made as to whether or not drainage was used, nine improved and five died.

The postoperative treatment consists mainly in placing the patient in a Fowler position, giving him fluids, including glucose, in some manner other than orally for the first 24 hours. Following this, small amounts of water may be given by mouth, increasing the amount daily, after which other fluids and proper foods may be given carefully and in gradually increased amounts; also morphin in small doses as required, and gastric lavage as necessary. Needless to say, these patients should be put on a regulated diet, be kept under observation for a period of time consistent with their symptoms and well-being, and carefully observed in a "follow-up" service for at least one year following the operation.

As to prognosis and mortality, every surgeon knows that the successful outcome depends upon early diagnosis and early surgical treatment and that these are of greater importance than the ability and skill of the operator.

As shown in Table IV, death occurred in thirteen cases of this series, representing a mor-

TABLE IV

MORTALITY

Type of Ulcer	Operative Procedure	Time Interval before Operation	Postoperative Time of Death	Post-Mortem	Use of Drains	Cause of Death
Gastric	Simple Closure	4 hours	1 day	none	not stated	Shock (probably)
Duodenal	Actual Cautery	4.5 days	6 days	yes	not stated	General Peritonitis
Gastric	Simple Closure	10 days	2 days	yes	yes	General Peritonitis
Duodenal	Closure plus Gastroenterostomy	not stated	3 days	no	yes	Sudden Death, Probably Pulmonary Embolism
Gastric	Excision	4 hours	16 days	no	yes	Peritonitis (probably)
Gastric	Excision, plus Gastroenterostomy	5.5 hours	6 days	no	yes	Acute Peritonitis (probably)
Duodenal	Simple Closure	7 hours	14 days	no	not stated	General Peritonitis (probably)
Gastric	Simple Closure	27 hours	40 days	yes	not stated	Subdiaphragmatic Abscess, General Pyemia
Pyloric	Excision and Horsley Pyloroplasty	6 hours	60 days	yes	not stated	Post-Operative Pneumothorax, Bronchopneumonia, Pulmonary Atelectasis
Duodenal	Simple Closure	23 hours	5 days	yes	yes	Peritonitis; Bronchopneumonia
Gastric	Cautery and Closure	24 hours	1 day	yes	yes	Bronchopneumonia; Acute Peritonitis
Gastric	Simple Closure	40 hours	2 days	no	yes	Peritonitis (probably)

tality rate of 24.5 per cent. Of these thirteen cases, five died who were operated upon within the 7-hour period, while seven others who died were operated upon within a period of time ranging from 20 hours to 10 days following the onset of the perforation. In one case the time period was not stated. In only six of these cases were postmortem examinations held. Steinbuck[33] believes that, in those dying within 3 days of the operation, death is usually due to shock; those dying in a week usually succumb to peritonitis; and those dying several weeks or months after the operation usually die of subphrenic abscess or liver abscess. He reports an average mortality of 31 per cent in a series of eighty-eight patients, while Ochsner[34] reports the mortality rate in the first 12 hours as averaging 28 per cent, and after 24 hours three times as great. Average statistics, however, of large groups reveal that when the operation is performed within the first 12 hours the mortality rate is 6 per cent; within 12 to 24 hours, 30 per cent; and after 24 hours, 80 per cent.

The value of the various surgical procedures as used in the treatment of these perforations cannot be shown or told, in so far as improvement or cure is concerned, until we learn to employ a very rigid, thorough and exhaustive follow-up system extending over a period of a year or two. As already mentioned by Brenner,[32] only by careful follow-up records extending over many months can reliable statistics be obtained as to ultimate cures. Lewisohn[35] has most diligently and thoroughly followed up his cases of acute perforations and says that while he feels that radiology ought to be freely employed in follow-up clinics on these cases, yet, in the presence of a previous operation on the pylorus or duodenum, a deformed bulb is not a definite indication of the presence of a recurrent ulcer; that, on the other hand, marked tenderness of this region during the fluoroscopic examination, niches and retention, indicate that the patient still suffers from an inflammatory process at or near the pylorus.

With the excellent and generous assistance of the social service and out-patient departments of these hospitals where the patients were treated, I have attempted by letters, questionnaires, and interviews, to reach these patients and persuade

TABLE V.

END-RESULTS

No.	Type of Ulcer	Year of Operation	Operative Procedure	Result	Symptoms	X-ray	Year of X-ray	X-ray Diagnosis
23	Gastric	1926	Simple Closure	Complete Recovery	None	None	.....	
8	Gastric	1922	Excision of Ulcer	Complete Recovery	None	None	.....	
17	Duodenal	1925	Posterior Gastro-enterostomy	Incomplete Recovery	Indigestion, nausea, pain	None	.....	
24	Duodenal	1926	Simple Closure	Complete Recovery	None	None	.....	
30	Duodenal	1927	Posterior Gastro-enterostomy	Incomplete Recovery	Indigestion, pain; on diet	Yes	1929	Healed duodenal ulcer; well functionating gastro-enterostomy
4	Gastric	1921	Posterior Gastro-enterostomy	Complete Recovery	None	None	.....	
18	Duodenal	1925	Posterior Gastro-enterostomy	Complete Recovery	None	None	.....	
9	Duodenal	1923	Posterior Gastro-enterostomy	Incomplete Recovery	Indigestion, can not eat all foods	None	.....	
6	Duodenal	1921	Posterior Gastro-enterostomy	Complete Recovery	None	None	.....	
22	Duodenal	1925	Simple Closure	Incomplete Recovery	Pains in stomach	Yes	1929	No definite evidence of ulcer niche; distinct pyloric deformity
15	Gastric	1924	Gastric Resection, Polya Anastomosis	Complete Recovery	None	Yes	1929	Colitis (spastic); well functioning gastroenterostomy
43	Duodenal	1929	Cauterization, Pyloroplasty	Complete Recovery	None	Yes	1929	Duodenal ulcer present
21	Duodenal	1925	Excision, Pyloro-plasty	Incomplete Recovery	Pyrosis, pain after meals	None	.....	
32	Duodenal	1927	Simple Closure	Complete Recovery	Sippy diet	Yes	1929	Probably healed ulcer
42	Duodenal	1928	Cauterization, Gastroenterostomy	Complete Recovery	None	Yes	1929	Duodenal ulcer; gastroenterostomy functioning well
14	Duodenal	1925	Gastroenterostomy	Incomplete Recovery	Ventral Hernia, pyrosis	None	.....	

them to appear at the hospital for physical and *x*-ray examination, to learn their present condition in so far as it related to the presence or absence of a peptic ulcer. The questionnaire, copied from one used by Young and his colleagues, is as follows:

1. How long have you been sick or ill before you came to the hospital?
2. How have you been feeling since that time?
3. Have you made a complete recovery?
4. Do you have now, or have you had at any time, any of your former or previous symptoms, pains, distress, stomach trouble or indigestion?
5. Do you take food well now?
6. Do you have any pain after eating now?
7. Do you have any trouble with the bowels, either constipation or looseness?
8. Have you gained or lost weight since the operation?
9. Have you any sickness, distress, vomiting, nausea, throwing-up your food, pain with meals, bleeding from the mouth, or hemorrhages?
10. Have you any bleeding by bowel, from the rectum, or black tar-like stools?

Because many patients of this series were transients who moved away from the city and

could not be located, and because others had failed to answer letters and questionnaires or return to the hospital for physical and *x*-ray examinations, I was able to trace only seventeen of the forty surviving members, a number too small to be of any great value in favoring any definite conclusions. Of these, one died of general paralysis two years after his operation. Of the remaining sixteen, I found seven who had duodenal ulcer perforation and three with gastric ulcer perforation who considered themselves free from symptoms and completely cured, and six duodenal ulcer perforation cases with recurrent symptoms and incomplete cures. Of the latter six, four had gastroenterostomy, one a simple closure, and one an excision of the ulcer area with a Horsley operation. Of the ten who had complete cures, three had a simple closure operation, three had a gastroenterostomy, two had excision of the ulcer—one followed by gastroenterostomy and the other by closure, one had a Polya anastomosis operation, and one a cauterization operation.

Lewisohn,[35] who has followed up thirty-three cases of perforated gastroduodenal ulcers with most thorough investigations, concludes that "conservative measures heretofore applied in acute perforations of gastroduodenal ulcers fail to effect a permanent cure in a large percentage of cases." He thinks it might be advisable to attempt a radical cure (subtotal gastrectomy) in cases which come to operation very early and where the infection has not spread beyond the immediate neighborhood of the ulcer.

A study of these fifty-three cases leads to the following conclusions:

1. Early diagnosis and early surgical treatment result in the lowest mortality.

2. Simple suture suffices, with a minimum of risk, in these acute emergency cases.

3. Patients should be kept on a restricted diet and under close observation at follow-up clinics for at least one year. If marked symptoms still exist at that time they should be subjected to a second operation as deemed most advisable by the surgeon.

My thanks are due to the superintendents of the Minneapolis General and Minnesota University Hospitals, as well as to the chiefs of the surgical divisions, the staff members and the social service workers of these hospitals, for their assistance and permission to review and study these cases.

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SERENIUM

According to advertising material sent by E. R. Squibb & Sons to physicians, "Serenium" is " . . . the result of a search for a compound that would be superior to other chemotherapeutic agents in the treatment of genito-urinary infections . . . synthesized by Dr. Ivan I. Ostromislensky . . ." The circular recites various more or less ideal qualities to be desired in such a preparation, leaving the impression that "Serenium" possesses these. For the claims made for the product the evidence is slight indeed. Squibb & Sons have apparently abandoned, so far as this preparation is concerned, the conservatism that has characterized the house for nearly three quarters of a century. The advertising does not present any real proof of merit. Squibb & Sons have not requested an examination of the product by the Council on Pharmacy and Chemistry. (Jour. A. M. A., May 31, 1930, p. 1783.)

THE ACTION OF VITAMIN D

Viosterol administered to animals over long periods in doses 100 times greater than the minimum antirachitic level showed no effect on general appearance, growth, reproduction, or resistance to respiratory infections. An overdosage ten times greater was just perceptibly harmful, 4,000 times overdosage definitely injurious, and 40,000 times overdosage strongly toxic. Apparently the harmfulness may be modified by other dietary factors. Recent studies have made it clearer that Vitamin D controls calcification of the skeleton by dissolution and deposition of the bone salts. The mineral content of the bones is the resultant of these two actions. Calcium and phosphorus must be present in the diet in sufficient amounts and in appropriate relationship to each other before proper bone growth or calcification can occur. No amount of vitamin can correct an absolute lack of bone-building salts. (Jour. A. M. A., May 10, 1930, p. 1505.)

A CASE OF TETANY AND EDEMA IN THE NEW BORN*

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TETANY in the new-born infant has not been frequently reported. It is the purpose of this paper to report such a case together with the autopsy findings and in so doing to support the contentions of certain writers that this condition is perhaps not so uncommon as has been thought to be the case.

Kehrer[1] in 1913 reported a series of six cases of tetany in the new-born. The essential characteristics of the picture were spastic contractures of the upper and lower extremeties, positive Chvostek and Trousseau phenomena, hyperactive reflexes with frequent ankle clonus, irregular tonic and clonic contractions of the musculature of the face and extremeties and, in one case, increased electrical excitability. The muscular spasms were not constant. The slightest disturbance would precipitate them. Cyanosis, especially about the face, was noted in several cases. The hand sometimes assumed a fist position in the spasms while at other times the fingers were extended in typical carpal spasm. The position of the feet was that of the classical pedal spasm. A hard edema was present over the trunk and extremeties in two cases. These two were included among the five infants who were afforded prompt relief upon the administration of calcium. One of the series died but it is not indicated in the text whether or not calcium was administered before death.

Von Reuss[2] does not concur with this author in the diagnosis of tetany of the new born. Grulee[3] also, as most of the other writers on the subject,[4] has taken a similar position. Shannon[5] on the other hand, agrees with Kehrer and feels that tetany is not extremely uncommon during the new-born period. He has reported several cases in which this group of symptoms occurred in conjunction with a generalized edema of the new-born, both the edema and the nervous manifestations yielding rapidly to therapy directed at the calcium deficiency. In further support of this contention the following case is presented.

The patient, a baby boy, was born October 4, 1929, by normal delivery. On October 6 he developed symptoms which proved to be due to a low grade peritonitis of indeterminate origin. After operation on October 7, he improved rapidly so that by the evening of October 9 he looked very well indeed. During this time he had been receiving some breast milk and a complementary feeding of half milk and half water plus five per cent dextri-maltose. Five hundred and eighty c.c. of .9 per cent NaCL solution had been given by hypodermoclysis from October 6 to 9 inclusive.

Late on the afternoon of October 9, moderate generalized edema was noted. This was much more marked by the morning of October 10. At this time definite nervous symptoms were noted in the patient. They consisted of periodic spasmodic strabismus, spasm of the circumoral muscles giving rise to the pursing or pouting position of the lips, hyperactive reflexes and a condition of general rigidity affecting muscles of the trunk as well as those of the extremeties. The position of the feet was that of extension of the foot at the ankle with plantar flexion of the toes. The hands for the most part were clenched tightly in the fist position but at times would assume the obstetrical position. There was a tendency to a flexion of thighs on the abdomen and of the knees on the thighs. The arms were flexed at the elbows. The infant cried out frequently and the least disturbance would give rise to a sudden extension of all four extremities with gradual return to the flexed position described. The Chvostek was definitely positive.

Parathyroid extract, 0.25 c.c., was administered at 11:45 a. m. by hypodermic injection. Ten grains of calcium gluconate in water was ordered at frequent intervals, a total of 55 grains being given throughout the rest of the day. At 5 p. m. the edema and the nervous signs were more marked. At 9:30 p. m. the muscular rigidity had somewhat relaxed and there was a perceptible decrease in the edema. The Chvostek was slightly positive. Slight pursing of the lips still occurred as did also the strabismus, at intervals. The hands were rather stiff. Another 0.25 c.c. of parathyroid extract was given at 10:00 p. m. During this time the patient had nursed and taken the complementary feeding well. His general condition was excellent.

By the morning of October 11, a loss of four ounces in weight had occurred accompanying a marked loss of edema. The patient was very placid, lying in the crib quietly without crying. He took his feedings well. The Chvostek was absent as were also the general rigidity, spasms of the hands and feet, and pursing of the lips. Occasional spasmodic strabismus still oc-

*From the Children's Hospital, Saint Paul. Read before the Minnesota Pathological Society, April 22, 1930.

curred. A total of 50 gr. of calcium gluconate was given throughout the day.

By October 12, a loss of two more ounces in weight had occurred with a further reduction in the edema. The Chvostek was still absent and spasmodic strabismus no longer noted. However, the infant was slightly more irritable and the knee jerks were definitely increased. The general condition was excellent in spite of the fact that the abdominal skin wound, which had broken open the night before, was wide open and showed no signs of healing. Feedings were taken well. Slight regurgitation was noted. A total of 70 gr. of calcium gluconate was given throughout the day and 0.25 c.c. of parathyroid extract.

By October 13, the edema had almost entirely disappeared. However, the nervous symptoms were slightly increased in that the Chvostek was just demonstrable. A total of 60 grains of calcium gluconate were administered throughout the day. The infant continued to nurse well and appeared in splendid condition.

By the evening of October 14, the edema was defiitely increased. Marked increase in nervous symptoms had occurred. The Chvostek was marked. In addition a definite masseter jerk and a jerking of the head toward the side from which the impulse came occurred with each tapping of the cheek. This latter was due to sudden contraction of the neck muscles. The patient was irritable, crying much more than the preceding day. General rigidity was increased and the arms and legs, hands and feet were spastic. The hands were held in a tightly clenched position. The general condition of the patient was very good, although the abdomen was slightly distended and the infant rather constipated, for which enemas were employed. Feedings were well taken, and no vomiting occurred. A total of 60 gr. of calcium gluconate was given throughout the day. Parathyroid extract was purposely withheld.

The next morning (October 15) the edema was slightly increased but very marked increase in nervous symptoms had occurred. The Chvostek, masseter and neck jerks were very marked. General rigidity and spasticity of trunk and extremeties was extreme. Carpopedal spasm was present. Spasmodic strabismus was very marked. The patient vomited some at every feeding. Rather obstinate constipation and some distension continued, necessitating frequent enemas. The blood calcium was found to be 9.0 mg. per 100 c.c. Calcium gluconate was discontinued after 30 gr. had

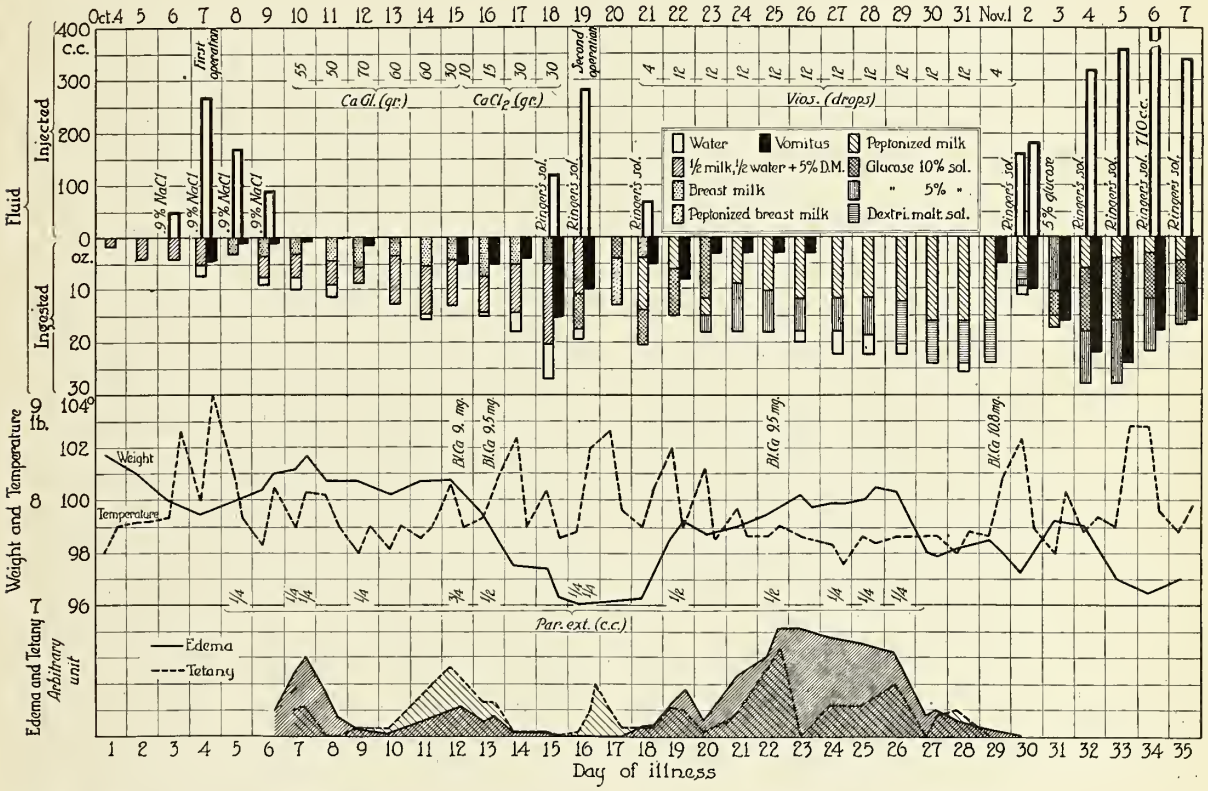


Fig. 1. The chart is for the most part self explanatory, with the exception of the lower tier of shaded areas and certain of the abbreviations. The former constitute a graphic representation of the degree of tetany and edema noted clinically at the various periods of observation. The unit is necessarily arbitrary but the method affords a striking and sufficiently accurate means of picturing what was actually observed. In the upper diagram some of the fluid represented as ingested was really introduced per rectum and similarly some of that recorded as vomited was lost through failure to retain rectal instillations and through intestinal fistulas. Of the abbreviations Ca.Gl. stands for Calcium gluconate, Vios. for viosterol and par. ext. for parathyroid extract (Collip).

been given and calcium chloride in five grain doses substituted. Three-quarters c.c. of parathyroid extract was administered at 4:20 p. m.

On the morning of October 16, there had been a loss of five ounces in weight with a definite loss in edema. A marked decrease in nervous symptoms had also occurred, the Chvostek being barely discernable and general rigidity and irritability less pronounced. However, spasmodic strabismus was still prominent and reflexes were hyperactive. In general appearance the patient seemed to be comfortable and in good condition. The skin wound was still open, however. Vomiting had occurred frequently during the night after the calcium chloride was given. Blood calcium was found to be 9.5 mg. per 100 c.c. By evening there was an increase in the edema. One half c.c. of parathyroid extract was therefore administered at 8:30 p. m. Calcium chloride had been discontinued since noon because of the vomiting.

By the morning of October 17, a further loss of 7.5 ounces in weight had occurred, with almost complete disappearance of the edema. There remained only an edema of moderate degree over the scrotum. Nervous irritability had entirely disappeared. The Chvostek was absent. Vomiting was much less, the patient having nursed and retained a feeding of 2.5 ounces at a morning feeding. The abdominal wound seemed to be healing to some extent. Thirty gr. of calcium chloride were given during the day.

At the morning visit of October 18, it was found that an abdominal fistula had occurred, apparently involving the upper portion of the small intestine. Considerable loss of ingested fluid occurred through this opening although no vomiting at all occurred. A loss of 1 ounce more had occurred since the preceding day. With it all trace of edema had disappeared. All nervous symptoms of tetany were also absent. The patient took fluids eagerly and nursed vigorously at the breast. One hundred twenty c.c. of Ringer's solution were given by hypodermoclysis.

On the morning of October 19, all signs of edema and tetany were absent. The patient appeared vigorous and active. Ingested fluid and food was coming through the fistulous opening so quickly that it seemed advisable to attempt to close it. This was done. Large amounts of Ringer's solution were given subcutaneously both before and after the operation. Late in the afternoon the general appearance of the patient was good. However, a beginning general rigidity was noted and the Chvostek was positive. No edema was noted. Parathyroid extract (0.25 c.c.) was given. This was repeated at 11:00 p. m. when all nervous symptoms seemed to have increased in severity. Edema was still absent.

The following morning (October 20) the Chvostek was still slightly positive but general rigidity was less marked. Spasmodic strabismus was still present. The Chvostek was slightly demonstrable. By evening the Chvostek was absent and there was no strabismus. Reflexes, however, were rather hyperactive. The calcium had been discontinued since the operation and was never reordered.

On October 21, a slight return of edema was noted in the morning. Nervous symptoms were about the same as the night before. The general condition of the patient was very satisfactory. Viosterol, 2 gtt. per feeding, was ordered on this day. During the night the wound broke open again and discharged a small amount of intestinal contents.

On the morning of the twenty-second the patient was definitely more irritable. He jumped at sudden disturbances, extremeties were rigid, and spacticity of the hands and feet was observed. The Chvostek was positive. Parathyroid extract (0.5 c.c.) was given at 10:30 a. m. The edema noted the day before had increased markedly and there had been a corresponding increase in weight of 10 oz. Hypodermoclysis of Ringer's solution had been given during the night and the morning. By evening the edema had increased perceptibly in spite of the parathyroid extract but there was a slight decrease in nervous irritability. The general appearance of the patient at this time was surprisingly good. Slight drainage of intestinal contents into the wound was noted. Moderate vomiting occurred. Temperature had been somewhat elevated during the day.

On the morning of October 23, a very definite decrease in edema had occurred. The Chvostek had disappeared and an accompanying loss of other nervous symptoms was noted. Vomiting was relatively slight. Distension occurred during the day and was relieved by enema.

By the morning of the twenty-fourth a marked increase in the edema had occurred. The Chvostek was present to a slight degree. Throughout the day both edema and nervous irritability increased. October 25 the Chvostek, neck and masseter jerks were very definite, the patient was extremely irritable and spastic, cried a great deal and the edema had increased. The abdominal fistula seemed to be closing, a very small amount of intestinal content coming through on the dressings. Blood calcium at this time was found to be 9.5 mg., so 0.5 c.c. of parathyroid extract was given hypodermically, at 2:45 p. m. Edema and nervous symptoms continued to increase throughout the day.

October 26 the edema was greater than on the morning of the twenty-fifth but less than on the evening of that date. Marked edema was present over the scalp, trunk, scrotum and extremeties. That over the thighs, to a less extent over the calves and upper arms, was a hard edema such as has been described in scleredema. This same condition had been noted before in this case and had entirely disappeared under therapy. While such marked edema was still present a very definite decrease in nervous symptoms had occurred. The Chvostek was negative, the patient was placid and not at all irritable, there was no spasticity and reflexes were not hyperactive. The patient was perspiring very freely and, as always when edema was disappearing, was urinating very freely. Constipation was increasing, so petrolagar was ordered. By evening the edema had slightly decreased.

October 27 the edema seemed slightly less but was still very definite, especially the hard edema above noted. Nervous symptoms were increasing in that the

patient was crying and jumpy, and the Chvostek was positive. Reflexes were hyperactive. The patient was, however, eating well and not throwing up. Very slight intestinal drainage was coming through the fistula. Parathyroid extract, 0.25 c.c., was again given on this date.

October 28 the Chvostek was still positive and the edema was about the same. Another 0.25 c.c. of parathyroid extract was administered. On the twenty-ninth slight decrease in edema was noted but otherwise the picture was essentially the same. During this period the infant was eating well, not throwing up and appeared remarkably well except that an obstinate constipation was present, requiring enemas. Again 0.25 c.c. parathyroid extract was given.

By the next day a tremendous change had taken place. The edema had melted away as shown by the loss of 9.5 ounces in weight. All swelling had left the face and scalp. Slight piting could still be demonstrated over the backs of the hands and dorsum of the feet. The scrotum was still definitely edematous. The hard edema had for the most part left the thighs and remained only in small spots of induration. Together with this loss of subcutaneous fluid there had occurred an almost complete loss of the nervous symptoms of tetany. The Chvostek was negative, the neck and masseter jerks had disappeared, the patient lay quietly in the crib and was not irritable, or jumpy and he did not cry. Reflexes were present but not hyperactive. He took his feedings greedily without vomiting. These were increased to four ounces per feeding in order to satisfy him. As was expected the patient was urinating freely. During the evening and the next day there was a slight increase in nervous symptoms and possibly in the edema, both of which receded rapidly so that both disappeared permanently by November 2, without further treatment than the administration of 12 gtt. of viosterol daily.

All day October 31 the patient continued to appear very well. He took his feedings well without vomiting except a very small amount of spilling over after taking his bottle. Practically no drainage occurred from the fistula. He suddenly developed the picture of an acute complete obstruction on the morning of November 1. Tetany or edema did not return. The blood calcium was 10.8 mg. per 100 c.c.

From this time on it was very evident that the patient was fatally ill from the obstructive condition. Measures employed included tube feeding, subcutaneous fluids, transfusions, and finally a third operation without success. The patient finally died, November 11.

At postmortem performed by Dr. K. Ikeda, a generalized plastic peritonitis was found with the intestines matted together in such a manner as to make it difficult to separate them even at autopsy. There were numerous pockets of pus throughout the mass. Spinal fluid calcium was found to be 5.4 mg. Very careful search was made for the parathyroid glands. Only one such structure was found and this was very small, about the size of a pin head. By serial sections two more parathyroids were found. No microscopic abnormality could be detected.

SUMMARY OF CLINICAL FINDINGS

The case then is that of a new-born infant who during a period of illness lasting slightly more than a month presented a group of symptoms which have previously been assumed by at least two writers as indicating a condition of tetany due to deficiency in the calcium metabolism. The underlying illness was a low grade peritonitis which eventually caused death. The symptoms that occurred throughout this illness consisted of certain nervous signs and a generalized edema. These symptoms were amenable to parathyroid and calcium treatment at first temporarily and finally permanently when viosterol was added.

The nervous symptoms were of several types. The first was a general nervous irritability the essential characteristics of which were sleeplessness, restlessness, frequent crying, and a constant primed state, like a coiled spring, which caused all types of slight disturbances to precipitate very much exaggerated responses. Secondly, there were the motor symptoms. These consisted of a general muscular hypertonia of the entire skeletal musculature, and of tonic spasms of the muscles of the arms and hands, legs and feet, and face and eyes. The spasms of muscles of the arms and hands gave rise to a rigid flexion of the forearms at the elbows, which in turn were pressed firmly against the chest, with most frequently a tight clenching of the hands into a fist position. At times the hands were flexed at the wrists with the extended fingers flexed on the palms at the carpophalangeal joints and the thumbs drawn beneath the fingers. The spasms of the legs and foot muscles held the thigh for the most part flexed on the abdomen with the legs tightly flexed at the knees and feet extended at the ankles. Toes were drawn down into extreme plantar flexion. At times the legs were rigidly extended and it was not unusual for the toes to be extended and spread. The positions described as usual for the legs and arms were occasionally interrupted, especially with the occurrence of sudden disturbances, by sudden spastic extension of all four extremeties with a slow return to the former position. Spasm of the facial muscles showed itself in occasional grimaces but for the most part by a pursing or pouting position of the lips; that of the eyes by a spasmodic strabismus affecting now one eye and then the other. Clonic spasms were not present in this case.

The third type of nervous irritability was shown by the presence of a markedly positive Chvostek. Trousseau's phenomenon could not be demonstrated with certainty since such spasm as it produces was constantly present. Unfortunately Erb's phenomenon could not be shown because proper apparatus was not available. Still another nervous symptom was noted in the extremely exaggerated reflexes. This was emphasized by the following phenomenon. Each time an attempt was made to elicit a Chvostek, not only did the facial muscles contract but also the masseter muscles suddenly closed the jaw and the neck muscles causing the head to jerk toward the side from which the impulse came.

The edema was mainly a simple edema effecting, in its most marked phases, all of the subcutaneous tissues such as has previously been described.[5] At times it was more prominent in the dependent parts giving rise to a lop-sided appearance of the various regions. On the other hand certain locations were more subject to its occurrence than others. It occurred earliest and persisted longest in the scrotum, dorsum of the feet and backs of the hands. While for the most part it was a simple pitting edema, on two occasions during the most extreme phases there occurred over the thighs especially and to a less extent over the legs and upper arms a hard edema similar to that described as occurring in scleredema. This pitted deeply but only under firm and continued pressure. As this edema receded under treatment it remained longer in small lumpy areas not in dependent areas.

SUMMARY OF THERAPY

Therapy in this case was of two types; that against the underlying peritonitis and the obstruction resulting therefrom, and that to combat the symptoms of calcium deficiency. The former consisted of breast feeding as long as possible and then the choice of artificial feedings that were thought to be best adapted to the needs of the infant, gastric lavage and gavage when necessary, rectal installations of normal saline and glucose, subcutaneous injections of normal saline and Ringers solution, petrolagar and enemata as obstruction developed, and finally blood transfusions. Reoperations were performed on two occasions by Dr. Harry Zimmermann in the effort to close fistulas and relieve obstruction.

Treatment of the calcium deficiency consisted of the administration of calcium gluconate and later calcium chloride by mouth, the administration of parathyroid extract (Collip) by hypodermic injections according to the clinical condition and calcium determinations, and finally the administration of viosterol as a reinforcement measure.

DISCUSSION

There are several features in this case which deserve special mention. The Chvostek has been almost universally denied any significant relationship to tetany at this age period. Such has not been the case in this or any other instance of new-born tetany that I have seen. The Chvostek appeared and disappeared along with the other nervous symptoms, very evidently dependent upon the same underlying factors. The fact that it is so very common in the new-born period may very well indicate that temporary failure of the calcium metabolism is indeed very common at this time.

The hard edema which resembles that occurring in scleredema was noted also in Kehrer's report. During development it was not noticed to be any different from that which was present over the rest of the body except that it gradually assumed the hard character described. During recession, however, a marked difference was noted in that instead of a gradual uniform disappearance it remained for a longer time in irregularly distributed areas giving rise to a lumpy character of the skin. These remaining areas were not confined to the dependent parts.

The extreme sweating noted at times of active symptoms is commonly found in tetany. Marked diuresis was present during periods of improvement in the edema, as would be expected. This effect on edema in certain cases of nephrosis, nephritis, and cardiac failure has been attributed to the effect of parathyroid extract by Meakins,[6] Reitzel and Stone,[7] McCann,[8] and others.[9] Hartley has observed similar effects on the edemas of pregnancy.[10] I also have reported it in the edema accompanying tetany of the new-born.[5] In this condition it would seem to be due to the increase in blood calcium since it also may occur under calcium therapy alone.[11]

Because of the fear that the first occurrence of edema might have been due to the large amounts of sodium chloride that had been injected under the skin, Ringer's solution was used for further hypodermoclysis. This did not alter the occurrence of edemas as long as the nervous symptoms of tetany persisted. However during the last few days of the infants life when all tetanic manifestations had at last been controlled, very much larger quantities of Ringer's solution were injected without the production of edema. Attention should be called to the fact that permanent disappearance of the tetany occurred only after viosterol was employed.

Blood calcium values deserve special consideration. Unfortunately this determination was not made before treatment was begun. However, in spite of very vigorous treatment preceding the first determination the figure was only 9.00 mg. per 100 c.c. This value alone would perhaps have very little significance but when one considers the relatively tremendous amount of treatment that had been previously employed, it becomes significant indeed. A total of 325 grains of calcium gluconate had been given during the five days preceding. Like dosage to an adult would have been about 53 grams per day. The 0.75 c.c. of parathormone would have been the equivalent of between 13 and 14 c.c. in an adult. That in spite of such vigorous treatment the blood calcium should not be up to normal[16] would strongly support the contention that some deficiency in calcium metabolism was present. The difficulties encountered in establishing a premanent disappearance of the nervous symptoms and the edema is worthy of special mention. Calcium feeding in combination with parathyroid extract produced several periods of temporary improvement. This could not be maintained on calcium alone as shown by the fact that shortly after the parathyroid was stopped the symptoms returned.

Finally calcium was discontinued entirely and viosterol was added in the amount of 12 gtt. daily. The last flare-up occurred shortly after this was started and was controlled by parathyroid extract in addition to the viosterol. The blood calcium at the end of this exacerbation was 10.8 mg. and neither nervous symptoms nor edema returned from that time on. This would suggest that for permanent raising of the blood calcium the viosterol were the best therapeutic agent. However, the possibility that by this time some deficiency in the body defenses had corrected itself must be considered.

That cases presenting these symptoms might be cases of tetany of the new-born was first mentioned by Kehrer. The nervous symptoms shown by his cases were practically identical with those recorded here. Von Reuss, by refusing to recognize Kehrer's opinions, has been apparently a powerful factor supporting the general idea that tetany is rare or perhaps never exists in infants of this age period. His main argument seems to be that laryngeal spasm was not present or at least not mentioned in this series. Grulee, while a little less dogmatic, still is inclined to disregard Kehrer's report, apparently largely because of the fact that in several of the series other disease was also present. He also states that laryngeal spasm has not so far been recorded in the new-born. He does mention certain hypertonic conditions of the new-born seemingly identical with some of the symptoms recorded in this and Kehrer's cases and considers them as something entirely apart from tetany. Most other writers share the opinions of these men.

The principal arguments against accepting this and Kehrer's cases as true tetany are these: that laryngeal spasm was not shown to be present, that other disease has been present in several instances, that the electrical reactions of tetany have not been shown to be present, that at least a number of the nervous symptoms recorded are relatively common in the new-born and have been considered physiological, and perhaps that the majority of opinion holds that tetany of the new-born does not exist.

As for the first of these arguments is there any sane reason why laryngeal spasm should be demanded as a criterion in tetany of the new-born? True it is common in infantile tetany. On the other hand it is not so frequent in puerile tetany and is rather unusual in adult tetany. To assume that it must be present in tetany of the new-born is to assume that this condition must be identical with infantile tetany, a wholly unfair provision. There is no more good reason for insisting on the presence of laryngeal spasm in tetany of the

new-born than in the adult forms of the disease.

The argument that other disease was present and that therefore the existence of true tetany is to be questioned is also invalid. It is well known that tetany of the infantile period is often brought to light by some intercurrent disease. Falta[12] has mentioned the fact that tetany in older individuals is often brought on by extraneous adverse conditions and Shannon[11] has emphasized the importance of accidental disease processes or other constitutional strain in bringing puerile tetany to light. He compared the affect of the parathyroids in tetany in this respect to the function of the pancreas in controlling diabetes. Lisser and Shepardson[13] also have called attention to this same fact in regard to tetany due to complete removal of the parathyroids during exterpation of the thyroid. The fact that tetany manifests itself more markedly under such adverse circumstances becomes, instead of an argument against, an argument for the existence of tetany during the new-born period, because it emphasizes one more similarity between this and the other recognized forms.

The importance of the electrical reactions must be questioned during this age period since no standard has been established. This is emphasized by the fact that Grulee says that the electrical irritability of the new-born is less than that of older children while von Reuss says exactly the opposite. It is indeed unfortunate that such observations were not possible on the case reported at this time.

The fact that many of the nervous symptoms have been formerly recognized as physiological can be given no credence at all. It is a fact that such symptoms as hypertonia, increased reflexes, clonic movements of the arms on being disturbed and a positive Chvostek reaction may occur in patients who eventually recover without any special form of treatment. However such a fact can not be construed to weaken the importance of observations showing that calcium and parathyroid treatment may accomplish this end quickly.

The fact that general opinion holds that tetany does not exist in the new-born period bears no weight whatsoever since general opinion is so frequently based upon the opinion of one or two outstanding authorities whether they be right or wrong.

On the other hand numerous reasons exist for at least approaching the subject with an open mind. Deficiency of the mechanism controlling calcium metabolism with the resulting symptoms which we are pleased to regard as tetany is not uncommon in older individuals from the period of two or three months on through old age. In fact it is especially common in pregnancy.[10] The inheritive nature of such deficiency is well recognized. I can see no reasonable excuse for assuming that the new-born period should be exempt. In fact there is more excuse for assuming that it might be more prevalent at this time than at any other age period since the traumas incident to birth together with the tremendous upheaval in organic function necessary to continued existence might very well give rise to temporary disarrangements of the body chemistry such as this condition implies. In fact it is my opinion that such is in reality the case. It is indeed interesting, if not significant, that the mother of this infant required calcium therapy to prevent tetanoid manifestations throughout her pregnancy.

The ever present question regarding the relation of parathyroid function to the calcium deficiency in tetany is as pertinent here as in other forms of this disease. That parathyroid deficiency is responsible in the idiopathic forms of tetany of older individuals is almost universally accepted. In the case of infantile tetany the contrary opinion of Howland and Marriott[14] still hinders universal acceptance of such a theory though it is apparently gaining more and more support.[15] Attempts to correlate pathological changes in the parathyroid glands with their apparent deficiency in tetany have been usually unsuccessful whatever the age of the subject and as a result it has been necessary to assume that the failure is a functional one. Similar failure has occurred in this case. So far as is known there was no quantitative or qualitative anatomical deficiency and if we are to hold that the failure of calcium metabolism was of parathyroid origin we must assume that such deficiency was functional in type. This would seem to be the logical opinion to maintain. At the same time it must not be forgotten that the real cause of the symptoms is apparently not the absence of parathyroid secretion but the absence of sufficient active calcium, and that this calcium insuf-

ficiency is probably not so much a quantitative as a qualitative thing. It therefore is perfectly possible that factors far removed from the parathyroid secretion, for instance acid-base equilibrium, may depress or otherwise divert the soluble calcium from its usual function as regards this symptom complex. In spite of such possibility, however, the rapid response of the condition to the administration of parathyroid extract makes it most reasonable to assume parathyroid failure as the cause.

CONCLUSIONS

1. Tetany of the new-born has been considered a rare condition.

2. A case of tetany accompanied by generalized edema is herein reported.

3. The symptoms of tetany and edema appeared during the course of a protracted illness due to a low grade peritonitis, this latter eventually causing death.

4. Both the nervous symptoms and the edema were strikingly amenable to therapy calculated to raise the level of the blood calcium.

5. This therapy consisted of calcium gluconate and calcium chloride by mouth, hypodermic administration of parathyroid extract (Collip) and the feeding of viosterol.

6. Temporary relief only followed the use of calcium and parathyroid extract. Permanent disappearance of the tetany and edema did not occur until viosterol feeding was combined with the use of parathyroid extract.

7. Blood calcium values, if not too low to be considered within the normal range, were at least at a consistently low normal level in spite of vigorous treatment until the symptoms of tetany and edema were permanently controlled, when an average normal value was found to be present.

8. It is therefore reasonable to assume that some disturbance of the calcium metabolism existed which resulted in either a qualitative or quantitative calcium deficiency, this in turn giving rise to the symptoms of tetany and edema.

9. By serial sections of tissue obtained at postmortem three parathyroid glands were found in none of which could any microscopic pathology be recognized.

10. If the parathyroid glands are to be held responsible for the calcium deficiency it is thus necessary to assume that the failure of these glands was functional in nature.

11. Such an explanation for the symptoms of tetany and edema noted in this case is rather favored, though it is fully realized that other internal chemical maladjustments rendering the calcium unavailable for its usual function might also be operative.

The blood calcium determinations and the autopsy in this case were performed by Dr. Kano Ikeda.

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CARBUNCLE OF THE KIDNEY*

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CARBUNCLE of the kidney, or staphylococcal suppurative nephritis, is a rare, but definite, type of renal suppuration, and a clinical entity entirely differentiated from the acute embolic renal infections more commonly seen. It is an acute metastatic lesion similar in origin to perinephritic abscess and acute septic kidney. A recent article by Dick[1] states that he was able to find only twenty-seven cases of this condition reported in the British literature. Several German writers, Reschke,[2] Nicholich,[3] Voss[4] and others, have written rather extensively of the condition and have propounded various methods for its treatment.

In 1911 Brewer[5] proved with experimental animals that trauma is an exciting factor in renal infections, particularly in the male patient. The primary focus is usually in the skin, or from acute osteomyelitis.

If carbuncle of the kidney is operated upon early in its course, the lesion is similar to a carbuncle observed in the skin, while later abscesses, either single or multiple, may be found localized in one portion of the kidney or involving the cortex in its entirety. According to Dick,[1] rupture into the kidney pelvis is uncommon, while rupture or extension through the cortex into the perirenal tissues occurs more frequently. The infection is usually unilateral, although Kretschmer[6] reported one bilateral case which terminated fatally. The onset is insidious, as the primary foci or exciting trauma may be overlooked. Pulmonary and other complications are common and the course of the disease is usually quite stormy unless an early diagnosis is made. These facts are illustrated by the following case.

CASE REPORT

The patient was a male, aged thirty-eight years, who was admitted to Glen Lake Sanatorium on October 3, 1928, for diagnosis and treatment of an active tuberculous lesion of the right lung apex.

The history of his illness dated from about August 14, 1928, when he developed a furuncle of the skin of the right thigh. The furuncle was lanced by the family physician, who observed the patient for the week following, and then advised him to return to work. After six days, the patient felt so weak and tired that he had to remain at home. The family physician was called again, and upon examining the patient, discovered an unexplained fever. Sequelæ from the furuncle on the thigh were not considered at that time, and although paratyphoid was suspected in addition to tuberculosis, all laboratory tests were negative.

An internist was called in consultation, who examined the patient and requested an *x*-ray study of the chest. The films revealed an apical tuberculous lesion in the right lung, which was assumed to be active and to be the cause of the patient's nightly temperature of 103 to 104 degrees.

About the middle of September, four weeks after the appearance of the furuncle and two weeks after the appearance of the fever, pus was discovered in the urine. Urinalysis at the onset of the patient's illness had been negative. Examination of the urine for tubercle bacilli was negative. At this time the patient had pain in the lower left chest and left renal area, which was intensified by deep breathing. The pain was still present and slightly increased when he was admitted to the sanatorium, six weeks after the onset of the furuncle.

After admission to the sanatorium on October 3rd, the patient's temperature continued to range from 100 to 103 degrees. Pain was present continuously in the left chest and renal area. The urine contained a trace of albumin, many leukocytes and an occasional red blood cell. Examination of the chest revealed a lesion in the right lung apex which was considered inactive. *The left chest was negative.* Tenderness was complained of upon palpation of the left renal area, although no tumor was felt.

Urologic consultation was requested and we advised *x*-ray examination of the kidney, ureters and bladder. No abnormal findings were reported. Cystoscopy was done on October 11. The bladder appeared normal through the cystoscope. Both ureters were catheterized without difficulty. Indigocarmin returned in normal time and concentration from both kidneys. The ureter catheters were allowed to remain in place for forty-eight hours for drainage, during which time periodic lavage was done. The ureter catheter specimens showed staphylococcus albus on culture from both sides. There were a few pus cells in both catheterized specimens, with possibly a few more from the left than

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from the right. Pyelography was not undertaken at that time.

Following the cystoscopy and the continuous renal pelvis drainage and lavage, there was a drop in the temperature for two days. The usual methods of therapy for renal infections, intravenous and otherwise,



Fig. 1. X-ray showing spine drawn to right; psoas shadow obliterated on left.

were employed without result. The patient continued to complain of increasing pain in the lower left chest and renal area, which was aggravated by deep inspiration. The temperature was present daily and rigidity was noticed in the area of the left kidney, particularly over the back.

A diagnosis of perinephritic abscess with lung complications was made. The patient's condition apparently contraindicated any surgical exploration at that time because the medical consultant observed physical findings in the left base which he assumed were tuberculous, a possible metastasis from the right lung apex. No tubercle bacilli were found in the sputum at any time.

An *x*-ray examination of the chest on October 29, twenty-six days after the previous *x*-ray study of the chest and ten days after the first positive physical finding in the left chest, showed the right apex unchanged, but the pleura was thickened over the entire left lung, with evidence of consolidation in the left base.

Urinary symptoms were present and more pus cells were found in the urine. Cystoscopy was repeated on November 12. There was some redness and swelling about the left ureteral meatus, but otherwise the bladder was negative. A pyelogram was made of the left side. This was not normal and was interpreted as an acute pyelonephritis. Stained specimens and cultures from both ureteral specimens revealed staphylococci, but no tubercle bacilli were found.

The patient's condition grew steadily worse; the pain in the chest was more severe and tenderness and rigidity in the left renal area more marked. An enlarging palpable mass was discovered in the region of



Fig. 2. Left pyelogram showing dilatation of minor calyces and broadening of isthmus of all calyces.

the left kidney which was thought to be a renal or perirenal abscess. Operative interference was again discussed, but rejected because of the condition of the patient.

On December 15 another X-ray examination of the chest was made. The shadow seen on the left side was smaller than previously reported. Since no tubercle bacilli were found in the sputum, the left pulmonary lesion was thought to be a metastasis from the left renal fossa.

Eventually we obtained a positive guinea pig reaction from the patient's bowel contents, which were thought to be inoculated by the swallowing of tubercle bacilli from the sputum. This was interpreted as evidence of pulmonary activity. Since the lung lesion in the left chest had not proved to be tuberculous in origin, and since lung complications are quite commonly the result of perinephritic infection, we again suggested exploration of the left renal area.

This was undertaken January 2, 1929. About one-half litre of thick, purulent material was evacuated as soon as the deep fascial plane was incised. One large abscess cavity was carefully explored, but a suppurative kidney was not identified. Drains were placed and the wound closed. The purulent material from the abscess cavity contained no tubercle bacilli, but pure cultures of staphylococcus albus were obtained. Large amounts of purulent material continued to drain from the wound for ten days. The patient's condition improved slightly, but his temperature still ranged from

103 to 103.5 degrees. The urine continued to show numerous pus cells and the white blood count was 20,900.

Nephrectomy was performed on January 12. The kidney was found to lie within a dense, adherent, fibrous envelope. This mass could not be delivered through the wound, as we could discover no cleavage line. After much dissection, the true renal capsule was reached. In doing this, a piece of renal tissue about the size and shape of a cherry freed itself from the kidney mass and fell loose in the wound. This was identified as a bit of sloughed renal tissue from one of the abscesses. The hole in the kidney cortex, produced by this sloughing mass, did not bleed. The true capsule was dissected away from the kidney and a sub-capsular nephrectomy was done. The pedicle was so large that ligation en masse was not possible. A renal pedicle clamp was left in place and sufficed as a drain. The removed kidney was almost entirely replaced by abscess cavities and necrotic tissue.



Fig. 3. External surface of operative specimen, showing abscess and portion of detached renal tissue.



Fig. 4. Bisected operative specimen, showing multiple abscesses throughout.

After nephrectomy, the patient's condition was so critical that continuous supportive measures were necessary. The wound continued to drain for a considerable time after operation. The temperature continued to range from 101 to 102.5 degrees. The urine finally began to show a decrease in pus cells and albumin. The patient's condition improved steadily and drainage gradually ceased. He was discharged from the sanatorium, temperature-free, on April 1, 1929, six months after admission. The last urine specimen examined contained two to four leukocytes per high power field.

Pus persisted in the urine specimens during the presence of the known prostatic infection and it is therefore a matter of conjecture whether or not the remaining kidney is infected or contains a destructive process. The urological tract has not been rechecked and subsequent events will have to be followed in order to establish the soundness of the remaining kidney.

PATHOLOGIC FINDINGS

Gross Findings.—The kidney was much larger than normal. There were petechial hemorrhages in the renal cortex which could be seen on the surface. The renal cortex was obliterated by multiple abscesses containing thick pus and necrotic material. One abscess in the mid-portion had ruptured through to the capsular surface of the kidney.

Microscopic Findings.—The capsule was partly destroyed and slightly infiltrated with lymphocytes and polymorphonuclear leukocytes. There were several small subcapsular hemorrhagic areas. The renal cortex showed marked proliferation of connective tissue elements and exudative reaction. There was a very marked infiltration with lymphocytes, polymorphonuclear leukocytes and plasma cells and there were numerous multilocular cortical abscesses well walled off. There were numerous hyaline glomeruli, several of which were atrophic and others obscured by polymorphonuclear and lymphocytic infiltration. The tubules showed the lumina filled with hyaline material and some pus, and the tubule cells were frequently hydropic.

Pathologic Diagnosis.—Acute suppurative pyelonephritis.

SYMPTOMATOLOGY

For convenience, the symptomatology of carbuncle of the kidney may be classified as general, local and urinary.

General Symptoms.—Chills and fever may be constant or intermittent, usually ranging from 100 to 104 degrees. Malaise, headache and the common symptoms of sepsis, together with leukocytosis, are present. These are always accom-

panied by increasing weakness of the patient, in spite of symptomatic treatment.

Local Symptoms.—Pain is of varying degree early in the course of the disease, but later becomes constant in the affected side. The pain may be in the chest of the affected side, due to reference or actual pulmonary extension, and is increased on deep respiration. Localized tenderness and rigidity on the affected side increase with the progress of the lesion. A tumor mass may or may not be present, although late in the course of the disease it is always present in the average individual.

Urinary Symptoms.—Urinary symptoms may be insignificant or absent. Examination of the urine may be negative early in the course of the disease, while minor urinary findings may be constant throughout. Rupture of the carbuncle into the renal pelvis results in exceedingly large amounts of pus, blood, bacteria and necrotic material in the urine. Urine from the affected side may be sterile before this occurs.

DIAGNOSIS

A careful and thorough history is of the utmost importance in establishing the diagnosis. If the clinician finds a patient between twenty and sixty years of age, who is toxic, with increasing weakness and a history of direct or indirect trauma over the kidney area on either side, he should be on the alert for a suppurating lesion in the kidney. A history of felon, carbuncle, furuncle, acute osteomyelitis, or infected eczematoid lesions, should remind the clinician of the possibility that these infections may metastasize to the renal or perirenal tissues. Pain in the chest with fixation of the diaphragm may lead to a suspicion of pneumonia, pleurisy or other pulmonary pathology. It must be remembered that the urinary symptoms may be very insignificant early in the disease and are therefore likely to draw the attention of the diagnostician away from the urinary tract.

In the later stages of the condition, constant pain, tenderness and rigidity, together with increased urinary findings and the palpation of a tumor mass, render the diagnosis obvious, especially if the patient has been toxic for many days. Leukocytosis is usually high and constant, from 10,000 to 30,000 cells per cu. mm., while the temperature ranges from 100 to 104 degrees.

When rupture of the lesion into the kidney pelvis has occurred, the pyelogram may make the diagnosis. In cases where rupture has not occurred, the pyelogram may be an invaluable aid in ruling out other pathologic conditions of the kidney. The differential diagnosis between carbuncle of the kidney and acute septic or embolic kidney may be very difficult and in many cases impossible.

Bacteriologic studies of the urine by culture may be a valuable aid in the establishment of the specific causative organism, which is usually a staphylococcus of the hemolytic type. Mixed infection may render this finding valueless or misleading.

TREATMENT

Great care should be exercised in the surgical treatment of perinephritic abscess, in order that a primary suppurative process in the kidney may not be overlooked.

Nephrectomy is the treatment preferred by the majority of the writers on the subject, and it has been recommended by Kretschmer, Voss, Barth, Israel and others. The operation should be performed as soon as the diagnosis is established. In many cases of long-standing suppuration, the drainage of a perinephritic abscess with secondary nephrectomy may be necessary, as governed by the condition of the patient. It is possible that many cases of perinephritic abscess in which nephrectomy is necessary eventually, are cases in which the diagnosis of the primary site of suppuration was originally overlooked.

In cases where the suppurating area in the kidney is small, partial resection of the affected portion of the kidney has been recommended by some writers, notably by Reschke.[2] Decapsulation of the organ has been recommended by Nicolich[3] in some types of cases.

This patient has been undergoing prostatic massage for a chronic prostatic infection which contains staphylococci. He has had a recurrence of boils in the skin of his back, but his general conditions has improved so that he is able to attend to his usual duties better than at any time during his life.

CONCLUSIONS

Our study of this case and our review of the literature has taught us the following facts:

1. The presence of a felon, carbuncle, furun-

cle, acute osteomyelitis or infected eczematoid lesion may produce an acute metastatic lesion in one or both kidneys. Complete rest and careful treatment of these foci, together with protection of the kidneys from trauma, may prevent carbuncle of the kidney.

2. The possibility of a renal lesion must be considered when temperature, malaise or prostration follows the severe infections mentioned above.

3. Urinary symptoms and findings may be negative.

4. In spite of evidence of other disease, an acute kidney infection must be expected following such severe infections as those mentioned above.

5. Lung complications are no contraindication to operative treatment, but are quickly relieved because they are the result of metastasis from the kidney.

6. Nephrectomy is always necessary; whether it should be a one- or two-stage operation will depend on the condition of the patient.

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PLASMOCHIN

"Plasmochin Compound" is stated by the manufacturer to be "sugar coated pills containing 0.01 Gm. of Plasmochin and 0.125 Gm. of quinine sulphate." The only way in which Plasmochin may be characterized as "extremely dangerous" is that its safe (but efficient) dose is much smaller than that of quinine. Its most important untoward effect is cyanosis due to methemoglobin formation. Abdominal pains have also been produced by it. It is liable to cause the symptoms of cinchonism, such as tinnitis and dizziness; and it has been charged with favoring the occurrence of blackwater fever. The Council on Pharmacy and Chemistry published a preliminary report on Plasmochin in 1927, when the product was not being marketed in this country. Now the Winthrop Chemical Company markets "Plasmochin Compound" but has not taken steps to make this preparation accepted for New and Nonofficial Remedies. (Jour. A. M. A., May 3, 1930, p. 1429.)

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DISTANT METASTASIS IN CARCINOMA OF THE CERVIX OF THE UTERUS*

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IN treatment by irradiation of carcinoma of the uterine cervix or fundus, the attention of the radiologist is confined, as a rule, solely to treatment at the primary site of the disease and to direct pelvic extension or local metastasis. This practice undoubtedly has arisen from the assumption that distant metastasis is rare or that it occurs only in the terminal stages of the disease, when intensive treatment is contra-indicated. Occasionally, however, one encounters the necessity of advising treatment for a patient with complete arrest of the pelvic disease, but with evidence of distant metastasis. I have not found reports in medical literature dealing with the question of the radiosensitivity of such metastatic deposits, although the amenability of the primary carcinoma to irradiation is well recognized. The remission of extensive metastasis from testicular tumors under appropriate irradiation has been frequently reported. Leddy recently emphasized the radiosensitivity of the metastatic deposits in bones from carcinoma of the breast. The favorable response of metastasis from carcinoma of the thyroid gland likewise is recognized; even metastatic deposits in the lungs and mediastinum have disappeared under treatment. The present study was undertaken to determine, if possible, the prognostic importance of distant metastasis in cases of carcinoma of the cervix and to assemble the data available as to their reaction under treatment.

From 564 postmortem examinations in cases in which carcinoma of the cervix was present, Albers Schonberg reported metastasis in the following frequency: in the liver, 13.7 per cent; in the lung, 4.07 per cent; in the peritoneum, 7.44 per cent; in the pleura, 1.95 per cent; in the kidney, 1.77 per cent; in the spleen, 1.24 per cent; in bones other than the skull, 0.83 per cent; in the heart, 0.7 per cent; in the pancreas 0.35 per cent, and in the thyroid gland, stomach, suprarenal glands, skull and dura mater, muscles, and mammæ, 0.17 per cent (one instance each). Feilchenfield reported metastasis to distant organs in 28.2 per cent of a series of cases; 15.4 per cent of the metastatic growths were in the lungs and liver. No one else has given as high a percentage of metastasis to the lung. Reichelman, in eighty-six cases, found metastasis in forty-nine; the liver was involved in 15.1 per cent of the cases, and the lungs in 4.6 per cent. That the regional lymph nodes lead in frequency as the site of metastasis, and that they are involved relatively early, is indicated by the fact that Wertheim found them involved in approximately 35 per cent of cases in which the primary lesion was operable.

Macallum stated that adenocarcinoma of the uterus developing from the tubular glands of the fundus uteri or from the more complex glands of the cervix, grows slowly in contrast to epithelioma of the cervix. In adenocarcinoma, metastasis is slow, but nodules do appear in retroperitoneal lymph nodes. There are a few cases in which the secondary growths are widely disseminated, and involve peritoneum, liver and other organs.

TABLE 1

INCIDENCE FOUND AT NECROPSY OF DISTANT METASTASIS FROM CARCINOMA OF UTERINE CERVIX (WERTHEIMER)

	Incidence of metastasis in various organs, per cent*	
	Irradiated (54 cases)**	Not irradiated (50 cases)**
Lungs	11.0	16
Liver	25.9	14
Spleen		4
Suprarenal glands	1.85	2
Heart	1.85	
Bones	1.85	2

*The brain was not examined. Metastasis in some organs which Wertheimer did examine is not reproduced here.

**Distant metastasis was present in 28 of the 54 patients (51.85 per cent) and in 27 of the 50 patients (54.0 per cent).

*From the Section on Therapeutic Radiology, the Mayo Clinic, Rochester, Minnesota. Submitted for publication May 15, 1930.

TABLE 2

SUMMARY OF DATA IN CASES IN WHICH PULMONARY METASTASIS TOOK PLACE FROM CARCINOMA OF THE CERVIX OF THE UTERUS

Case	Age, years	Type of carcinoma	Duration and extent of disease prior to discovery of pulmonary involvement	Symptoms referable to pulmonary involvement	Report of roentgenographic examination of thorax	Treatment after admission to clinic	Duration of life after diagnosis of thoracic metastasis
1	55	No biopsy	Hysterectomy one year before, extensive pelvic recurrence	Nonproductive cough	Diffuse involvement, miliary type, both lungs	None to thorax, treatment to pelvis for relief of pain	Died within one month
2	48	Squamous-cell epithelioma, graded 4	Six years, metastasis to both tibiæ	None	Multiple regions of metastasis	None to thorax, treatment of regions of skeletal metastasis	Died three months later
3	38	Squamous-cell epithelioma, graded 4	Six months, under treatment for three months with satisfactory arrest of pelvic disease	Sharp pain under right scaphoid, dry cough four months before diagnosis	Multiple regions of metastasis, both lungs	High-voltage roentgen rays to thorax	Died three months later
4	24	No pathologic report available	Carcinoma of cervix for five years, radium treatment elsewhere	Nonproductive cough	Multiple regions of metastasis on right side	None	Died in eleven months
5	32	Squamous-cell epithelioma, graded 4	Almost two years, under radium and roentgen-ray treatment second year, fairly well controlled	Dry, irritating cough and dyspnea for one month	Multiple regions of metastasis, both lungs	High-voltage roentgen rays to thorax for palliation	Died in about eight months
6	41	Adenocarcinoma, graded 4, with regions of colloid	Nine months, radium treatment elsewhere, cervical and supraclavicular nodes involved, massive pelvic involvement	Loss of weight and strength, breathlessness and palpitation	Multiple regions of metastasis	High-voltage roentgen rays to thorax for palliation	Died in about eight months
7	47	Squamous-cell epithelioma graded 2	One and a half years, under treatment at clinic six months, increasing pain	None	Multiple regions of metastasis, both lungs	None to thorax, treatment to pelvis for relief of pain	Died one month later
8	54	Papillary adenocarcinoma, graded 2	Two and a half years, hysterectomy in June, 1929, no extension beyond uterus and cervix noted at operation	None	November, 1929, multiple regions of metastasis in lungs	None to thorax, treatment for skeletal metastasis	No report
9	60	Carcinoma of fundus	Hysterectomy two years and eight months before	Cough of increasing severity, dyspnea after two months	Massive nodes at left hilum and left middle region of thorax, fluid at left base	High-voltage roentgen rays to thorax for palliation, treatment interrupted on account of reaction	Died two months later

TABLE 2—*Continued*

SUMMARY OF DATA IN CASES IN WHICH PULMONARY METASTASIS TOOK PLACE FROM CARCINOMA OF THE CERVIX OF THE UTERUS

10	49	Squamous-cell epithelioma, graded 3	One year and six months, under treatment by radium and roentgen rays, made some improvement, then pelvic disease again became active, cachexia	Chronic cough, not not distressing	Metastasis in left lung	None to thorax	Alive three months later, in poor condition
11	52	Papillary adenocarcinoma, graded 3	Two years six months, moderately advanced, under treatment by radium and roentgen rays became quiescent for over one year, then recurred	Weakness, no cough. Has had colds during winter	Extensive metastasis both lungs	None to thorax	Alive three months later, in poor condition
12	39	Squamous-cell epithelioma, graded 3	Two years, one year under treatment, with temporary arrest	None	Multiple regions of metastasis	None	Died six months later
13	56	Adenocarcinoma graded 3	Two years, satisfactory arrest of pelvic disease in last six months after radiotherapy	Dry cough recently lasting only one week	Multiple regions metastasis, both lungs	None	Alive one month later

In the early period of radiotherapy some apprehension was expressed that irradiation would increase the frequency of carcinomatous metastasis to distant organs. This view was expressed by Prochowneck, who noted the extreme rarity of these conditions after surgical treatment. Adler, in his monograph on radium therapy, stated that with the rarity of regional metastasis, and especially of metastasis to distant parts of the body in cases of carcinoma of the cervix, the relative frequency of them under radium treatment is doubly striking. He considered this fact as undoubtedly directly attributable to the influence of the radium treatment; the periphery of the tumor had received too little irradiation and, as a result, had become especially prone to proliferation. This idea of a stimulative effect from inadequate irradiation has been thoroughly refuted. Wertheimer has compared results of a series of postmortem examinations in cases in which irradiation was done with results in a series in which irradiation was not carried out. Her figures are given in Table 1.

For the purpose of this study the incidence of metastasis found at necropsy is of less significance than the incidence of such lesions noted in clinical examinations during the period when, on the basis of the pelvic disease and the patient's general condition, radiotherapy is warranted either for palliation or in an attempt to arrest or cure the malignant process. A review of a large number of cases has convinced me that such data would be extremely unreliable unless roentgenographic examinations were included at each examination, and great care was taken in recording negative data. Dyspnea of moderate degree is a common complaint in this disease, is most often the result of anemia and weakness, and by most clinicians is not considered suggestive of pulmonary metastasis. Analysis of symptoms in cases of pulmonary metastasis (Table 2) shows that a nonproductive cough is the most common feature but that often it is not sufficiently annoying for the patient to mention it unless she is questioned directly. The patient with even extensive metastasis may be entirely unaware of any respiratory distress. A small series of twenty-five necropsies in cases of carcinoma of the cervix performed at The Mayo Clinic includes two cases of pulmonary metastasis, neither of which had been detected in the clinical examination. In one case, roentgenogram of the lungs

TABLE 3

SUMMARY OF DATA IN CASES IN WHICH SKELETAL METASTASIS TOOK PLACE FROM CARCINOMA OF THE CERVIX OF THE UTERUS

Case	Age, years	Type of carcinoma	Duration and extent of disease prior to discovery of skeletal involvement	Treatment previous to occurrence of metastasis and result of treatment	Symptoms of metastasis to bones	Report of roentgenographic examination	Treatment of metastasis	Effect of treatment, if any	Subsequent treatment and effect	Duration of life after diagnosis of skeletal metastasis
1	54	Papillary adenoma, of uterus and cervix, graded 2	2.5 years	Hysterectomy four months before, no pelvic recurrence	Pain in left leg and knee	Destruction of inner condyle of left femur	Moderate-voltage roentgen ray to knee	Definite relief of pain for short period, pain returned with diathermy	Moderate-voltage roentgen ray one month after previous treatment, no effect to time of dismissal	No report (thoracic metastasis diagnosed at last observation)
2	56	Adeno-carcinoma	Extensive carcinoma of cervix 3.5 years before	Radium and roentgen rays, complete relief of symptoms, massive pelvic recurrence	Swelling of legs	Multiple regions of rarefaction in right ilium, probably metastasis	High-voltage roentgen rays	Great palliation immediately which continued over 3 months		Died 4 months later
3	48	Squamous-cell epithelioma, graded 4	6 months extensive pelvic disease	Radium and roentgen rays 2 months before with marked improvement	Pain in right leg below the knee	November, 1925, region of destruction in right tibia, February, 1926, region of destruction in tibia larger and metastasis in lower third of left femur and left tibia, January, 1926, pulmonary metastasis noted	November, 1925, moderate voltage roentgen rays to right tibia	Decided relief of pain but no retardation in development of metastasis	January, 1926 moderate-voltage roentgen rays	Died 5 months later
4	59	Adeno-carcinoma graded 3	10 years	Amputation of cervix, 1919, total hysterectomy for recurrent carcinoma of cervix 1921, prophylactic treatment by radium and roentgen rays, no pelvic recurrence	Stiffness of right knee and edema of right leg, severe pain	Region of destruction in right ilium, also palpable mass attached to inner surface of ilium	March, 1929, high-voltage roentgen rays to pelvis	Edema reduced, pain less	May, 1929, no roentgenographic change in region of destruction	October, 1929, very poor condition
5	65	No data	Advanced disease, duration unknown	2.75 years; radium and roentgen rays two years before	Indefinite pain in back and pelvis interfering with walking or climbing stairs, supraclavicular nodes involved	Region of destruction in right ilium	High voltage roentgen rays for relief of pain, treatment to cervical nodes	Complete relief for 3 months	None	No later report

		lioma, graded 3	carcinoma of cervix, 6 months	with complete arrest of pelvic disease	of muscles of left leg	(roentgenographic examination negative one month earlier)	gen rays	during treatment	ered inadvisable	
7	68	Squamous-cell epithelioma, graded 4	2 years extensive carcinoma of cervix	Treatment by roentgen rays elsewhere	Severe pain in right leg, relieved by treatment by roentgen rays elsewhere but patient unable to use leg	Large region of metastasis in greater trochanter and shaft of right femur	High-voltage roentgen rays and radium	Not reported	None	Lived 6 months
8	46	Squamous-cell epithelioma graded 4	6 months	Total hysterectomy, vaginal fistula repaired	Throbbing pain in head, also pain in right leg and back 9 months after operation	Metastasis in skull; lumbar part of spinal column, pelvis and thorax negative	None	Rapid increase in regions of destruction in skull in 1 month	None	No report
9	53	Squamous-cell epithelioma, graded 4	3 years	Hysterectomy	Pain in hips and back, starting soon after operation, increasing in severity for three months to time of observation	Small region of destruction in fourth lumbar vertebra and furring of disk, possibly tuberculous	Radium needles to small recurrent growth	No report	None	No report
10	54	No data	10 months carcinoma of uterus with vaginal involvement	None	Severe backache	Complete destruction of ramus of right pubic bone	None	None	None	Unknown
11	44	Squamous-cell epithelioma, graded 3	1 year, 3 months	Cautery to cervix, vaginal hysterectomy, postoperative radium and roentgen rays	Constant ache in hips and back starting 1 year after operation	Destruction of lumbar vertebræ, second, third and fourth, diagnosed 4 months after onset of pain	None	None	None	Unknown
12	49	No biopsy	4.5 years (very extensive pelvic disease when first examined)	Radium and roentgen rays with 4 years arrest of disease	Pain in left hip	Extensive destruction in right ilium (8 months after onset of pain)	None	None	None	Died 5 months later
13	59	No biopsy	Moderately advanced pelvic disease symptoms for 5 months	Radium and roentgen rays	Pain in right ankle, with swelling 3 months after treatment	Metastasis in lower third of right tibia	None	None	None	Died 6 months later
14	60	Carcinoma of fundus	2 years 8 months	Hysterectomy	Pathologic fracture first symptom	Destructive lesion in right femur with pathologic fracture	None			Died 2 months later

had not been made; in the other case, the roentgenogram taken one month before death failed to reveal the lesion.

Severe and often intractable pain in the lumbar or sacral regions radiating into the legs is one of the most common symptoms in advanced carcinoma of the cervix. This is usually attributed to impingement on the sciatic nerve or the lumbar plexus, or to compression of the ureters with resultant hydronephrosis. The clinician or radiologist rarely seems to make an effort to determine the exact origin of the pain.

In a study of twenty-four patients with uterine carcinomas, thirteen of whom had metastasis to the lungs, and fourteen metastasis to the bones, I have indicated the stage of the disease at which metastasis was recognized, the type of malignancy in each case, and the significant symptoms and their severity.

Data concerning the cases in which pulmonary metastasis took place are given in Table 2. Metastasis of both adenocarcinoma and squamous-cell epithelioma took place, with malignant characteristics graded from 2 to 4, according to the classification of Broders. There was satisfactory eradication or control of the pelvic disease by either surgical or radiotherapeutic treatment in four cases; in the others, active carcinoma was present in the pelvis. The freedom from distressing symptoms in the majority of cases of the group is especially notable, and indicates the probability of overlooking secondary growths, except through roentgenographic examinations made as a routine. Three patients in whom pulmonary metastasis has been discovered recently are living. The remainder died in from one month to eleven months after the pulmonary lesions were detected. In only three cases (treatment was abandoned in a fourth case because of reaction) was any attempt made to arrest the development of the pulmonary growth by irradiation, and in these cases, through accidental circumstances, there has not been an opportunity to trace the result of such treatment by later roentgenographic or clinical study. When there is evidence of rapid dissemination of the carcinoma, with general cachexia, the radiologist is scarcely justified in applying extensive radiotherapy. Probably only rarely will a patient be found who is in good general condition, with other manifestations of disease in satisfactory control, for whom a trial of intensive irradiation for pulmonary metastasis is warranted. In such cases, from the radiologist's point of view, treatment should be pushed energetically until sufficient experience has proved or disproved the possibility of influencing the development of pulmonary invasion in this type of carcinoma.

In Table 3 is presented a summary of clinical data in regard to the fourteen cases in which metastasis to bone took place. Pain seems to be an invariable symptom of this form of metastasis, but with concomitant adnexal infiltration, the causative factor underlying the pain may be in doubt. Malignant deposits in the lower extremities had been regarded as infectious destructive processes in two instances, and their malignant nature was recognized only as the disease became manifest elsewhere. In one instance, destruction of the right ilium occurred ten years after hysterectomy for the primary disease, with no evidence of local recurrence. Palliation has resulted from radiotherapy in some instances, although there are often complicating factors to consider in explanation of the relief of pain. In the few cases concerning which we can form an opinion, the relief of pain has seemed to be less definite and prolonged than that experienced in the treatment of metastasis to bone from carcinoma of the breast.

CONCLUSIONS

1. Metastasis to distant regions, from carcinoma of the cervix and fundus of the uterus, occurs more frequently than is ordinarily assumed.

2. Pulmonary metastasis often is not accompanied by distressing symptoms, so that only by frequent roentgenographic examination is it detected in the early stages.

3. The presence of metastasis in bones often is overlooked because of complicating circumstances which may account for pain. Metastasis to the extremities or skull often is mistakenly attributed to inflammatory destructive lesions.

4. Some relief of pain may be secured by effective irradiation of metastatic growths in bone from carcinoma of the uterus. This response seems less definite and less prolonged than that obtained in secondary growths from carcinoma of the breast.

5. There are not sufficient clinical data to warrant an opinion as to the radiosensitivity of pulmonary metastasis from uterine carcinoma. From the standpoint of greater precision in the application of radiotherapy a fair trial of such treatment in well selected cases should be made.

CASE REPORT

PULMONARY ASBESTOSIS: REPORT OF A CASE*

RALPH G. MILLS, M.D.,
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Interest in the injury to the lungs produced by the inhalation of asbestos dust has been aroused in the last six years, and several reports of cases have appeared in the medical literature of Great Britain. Aside from an occasional editorial or incidental mention, little has been written in this country about the condition. Apparently this is the first case reported from the United States. Nevertheless asbestos is mined or manufactured in many portions of this country. Undoubtedly injury to the lungs of some of these numerous workers has occurred, and may have been directly or indirectly responsible for death without the real condition being recognized. This case is reported in the hope of arousing more widespread interest in the disease and establishing it as an entity with which American physicians surely will have to deal.

REPORT OF CASE

A man, aged fifty-eight years, came to The Mayo Clinic May 26, 1929, in extremis, suffering from cardiac disease. He was taken to the hospital immediately on his arrival, and such studies were made of the disease as his condition permitted. Not a great deal was then known of his earlier history except that as a boy he had travelled the seven seas with his grandfather, who was a sea captain. He lived well and drank heavily during this period of his life. For a number of years he remained in the tropics, and finally, in 1898, contracted yellow fever. After recovery from this disease he returned to the United States and engaged in various enterprises, among others, the manufacture of brick. Subsequently, it was ascertained that the patient had been working in South America from 1911 to 1913; the significance of this fact will appear later. Aside from the illness due to yellow fever, he was thought to have been in good health until 1924, when he had an attack of dyspnea, with mild, but increasingly severe, congestive heart failure. Five distinct attacks, characterized by these same symptoms, had been experienced before the last seizure, which occurred in December, 1928, following a type of respiratory infection called influenza.

General examination revealed that there was dyspnea, cyanosis, and congestion of the lungs. The systolic blood pressure was recorded as 160 mm. of mercury, and the diastolic pressure, as 110 mm. The heart was enlarged, and there was a systolic murmur at the apex. Ascites and edema of dependent portions were present, and the liver was large and tender. Examination of the ocular fundi disclosed sclerosis of the retinal arteries, of the hypertensive type, with two small hemorrhages in the retina. Roentgenologic examination of the thorax gave evidence of an enlarged heart, and of passive congestion of the lungs. This plate, however, was taken in the hospital and was not satisfactory for further analysis of the condition of the lungs. Electrocardiographic examination gave evidence of complete heart block.

During the patient's stay in the hospital he failed rapidly and dyspnea, cyanosis, and edema increased. The pulse became very irregular and manifested auricular fibrillation. There was venous congestion in the neck. Venesection was performed twice, and salyrgan, 1 c.c., was given intramuscularly once, and just before death by vein. The patient died two days after he entered the hospital. The clinical diagnosis was hypertensive cardiac disease of five years' duration, cardiac hypertrophy with congestive failure, of five months' duration, and complete heart block.

An abstract of observations at necropsy includes the following points of significance. The abdomen contained 4,000 c.c. of clear, straw-colored fluid. There were 300 c.c. of a similar fluid in each pleural cavity, and the pericardium contained 200 c.c. The heart weighed 600 gm.; the myocardium was yellowish pink, and beneath the epicardium were a few petechial hemorrhages. The consistence of the muscle was firm, and the surface presented a moderate amount of streaking. The coronary arteries were slightly sclerosed. The measurements of the heart were as follows: aortic valve ring, 7.0 cm.; mitral valve ring, 11.0 cm.; tricuspid valve ring, 14.0 cm.; pulmonic valve ring, 7.0 cm.; thickness of left ventricle, 1.8 cm.; depth of left ventricle, 6.0 cm.; thickness of right ventricle, 0.5 cm., and depth of right ventricle, 10.0 cm.

There were interlobar adhesions of the left lung, and the anterior surface of the lower lobe was covered with fibrous adhesions. Both lobes were grayish-brown and mottled, with anthracosis, marginal emphysema, and apical scarring. The consistence of the tissue of the lung was markedly increased. On the cut surface the color was recorded as grayish-brown, and the froth and fluid that exuded were increased in amount. The upper lobe of the right lung was of the same color and general appearance as the left; it was partly covered with adhesions. Apical scarring was noted in this lung, and there was also subpleural edema. The condition of the middle and lower lobes was essentially of the same nature; the lobes were united by interpleural adhesions. A calcified node of the hilum was found.

The liver was purplish-brown, coarsely nodular, and the cut surface was finely granular. There were scat-

*Work done in the Section of Pathologic Anatomy, The Mayo Clinic, Rochester, Minnesota.
Submitted for publication May 29, 1930.

tered regions of thickening in the capsule. The cut surface was mottled yellow and red, and there was definite fatty change in the hepatic parenchyma.

The anatomic diagnosis that was given took account of the features just mentioned and included a notation of silicosis of the lungs. Microscopic examination of the essential tissues was made. Numerous phagocytic cells that contained quantities of blood pigment were noted in the alveoli of the lungs. Special stains for iron demonstrated its presence in these cells and also in the walls of blood vessels and alveoli. There appeared to be some increase in the amount of readily visible elastic tissue in the lung. Fibrosis was very marked.



Fig. 1. A large mass of asbestos, measuring more than 1 mm. in length, obtained from the lung by digesting a portion of the tissue with fuming nitric acid. Evidence of degeneration is the presence of the cross striations in the fibers. The darker portion of the fiber had a distinct yellowish-brown color (x75).

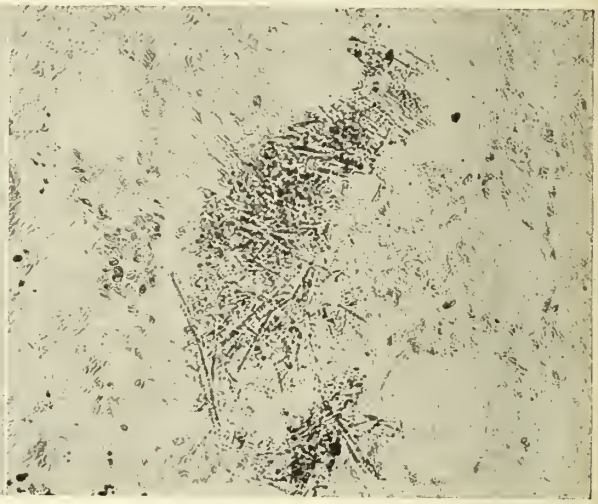


Fig. 2. A tangled mass of asbestos fibers in an unstained section of pulmonary tissue. From its distribution one would suspect that it had been dilodged by the microtome knife. The scattered black dots are "asbestosis bodies," indicating that a portion of the fibers, at least, had undergone change in the tissues (x175).

COMMENT

During the final survey of the sections in this case there were observed certain peculiar, brownish, fibrous structures, apparently foreign bodies, in the tissue from the lung, usually embedded in connective tissue, and often engulfed by large giant cells. They did not take the ordinary stains, and some of them were shown to contain iron by the Prussian blue reaction. There was much discussion as to the nature of these bodies, without any conclusion being reached. The possibility was considered that they might be asbestos fibers, but at that time there was little basis for such a contention. There was no history of exposure to asbestos dust, and certain apparent differences were observed between the reactions of these fibers and those shown by commercially prepared asbestos. However, further study strengthened rather than weakened the impression that the bodies were asbestos fibers. Evidently the fibrosis of the lungs was in some way connected with the presence of these foreign bodies. The idea was further entertained that the fibrosis of the lungs was responsible for progressive increase in resistence to the circulation through the organs, and may have led to hypertrophy and finally to dilatation of the right side of the heart. The systolic pressure of the blood was not greatly elevated when it was recorded, but the diastolic pressure was relatively too high. The heart weighed as much as many hearts in cases in which hypertension was the underlying lethal factor. The complete heart block was hardly to be explained on the basis of partial obstruction. There seemed to be no final answer to several questions connected with the case.

Shortly after the death of this patient, I corresponded with one of his business partners, and mentioned the fibrosis of the lungs. I also wrote that the fibers found looked more like bits of asbestos than anything I could think of, and asked if, fifteen years or more before his death, the patient could have been exposed for any considerable time to inhalation of inorganic dust such as asbestos, or any material that would give sharp, angular particles as well as longer, irregular fibers.

More than eight months after this letter was written, a business associate called on me, and stated that he had ascertained that the deceased had, as a young man, worked in an asbestos mine in South America. Later still, another business associate wrote that while the patient had been in South America he had drilled asbestos bearing rock. The shot holes were cleaned by air. Presumably this was prior to 1898, when he left the tropics, or at least thirty-two years before his death.

The study of the lungs and heart was resumed, so far as material was available. This unfortunately was limited. A few small pieces of pulmonary tissue were subjected to the action of fuming nitric acid to oxidize all the organic matter, and to concentrate in the sediment any inorganic fibers or other particles that may have been embedded in the substance of the lung. The pulmonary tissue contained a surprisingly large amount

of fat which collected as fatty acid on the surface of the liquid. This was not a clear yellow, and a smear of it was made, with the idea that some of the fibers might have been caught in this material and thus prevented from settling to the bottom of the heavy fluid. The sediment collected from the bottom, after washing, was found to contain a few fibers, together with some small particles of silica. Such drastic treatment as boiling in fuming nitric acid would destroy most materials, even the finest fibers of asbestos, but would probably not affect appreciably the larger ones.

In the scum that collected on the surface of the solution of nitric acid were found several fragments that were certainly asbestos. The largest was more than 1 mm. in length (Fig. 1). This had the definite cross striations that are characteristic of altered asbestos fibers, as described by various observers.[2] When viewed under polarized light a portion of the mass was dark and there were brilliant streaks through it, thus duplicating the appearance given by a known sample of asbestos from commercial sources. A portion of the mass of asbestos had a yellowish-brown color of exactly the nature and shade presented by the control sample. The physical configuration also agreed with what one would expect of asbestos.

In Figure 2 are shown the asbestos fibers in a smear where they apparently had been spread through the tissues by the microtome knife. The section in which they were found had not been stained. A few golden-brown oval bodies were mixed with the fibers, suggesting that some alteration in their structure had taken place, but the condition of the main mass indicated that the center had been protected from this change in the tissues. Alteration apparently affected mostly the finer fibers, leaving the larger masses relatively unchanged for this long period of time. Search was made for the elastic tissue fibers about the blood vessels, and in the alveolar walls, but they could hardly be distinguished. These asbestos fibers did not show more plainly by polarized light. The golden-brown color of the fibers was a distinguishing feature under the microscope.

Smaller fibers of asbestos, when lying separate, seemed to have undergone changes not observed in larger fragments. The butt end of one of these fragments is shown in Figure 3. It had become enlarged and knobbed, and had a distinctly brownish color. There seemed to be an envelope of a lighter brownish color about a darker center; the latter was continuous with the fiber inside the giant cell. The frayed ends of the fiber gave place to the golden-brown oval bodies, whereas that portion within the giant cell was the least changed. The majority of asbestos fibers of small size lay in a confused mass of giant cells, which seemed to represent a foreign-body reaction. In Figure 4 is shown a scattered group of fibers, among which can be seen giant cells; the adjacent tissue of the lung has been undergoing interstitial fibrosis. The asbestos fibers were readily distinguished from elastic tissue fibers by their golden-brown color; the fibers of elastic tissue took a lilac-brown stain with hematoxylin. The former were unchanged by ordinary aniline dyes, whereas the latter were readily tinted by various methods usually applied to such tissues.

In certain areas the process was still more advanced and connective tissue of a more mature type was seen, sometimes in more or less circumscribed areas. Such a nodule of scar tissue is shown in Figure 5, but this is not entirely comparable to the so-called silicotic nodules found in cases of silicosis in which tuberculosis plays a part.

There seemed little doubt that many of the asbestos fibers had been almost completely removed from the tissues. The frequent association of partly absorbed fibers and the golden-brown oval bodies shown in Figure 6 leaves little doubt that the latter were derived from the former. They were often in the same giant cell,

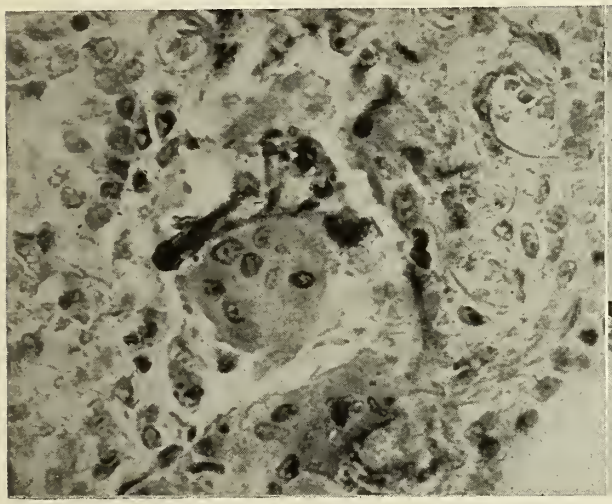


Fig. 3. A small fascicle of asbestos lying in a giant cell. A knob with a brownish envelope has developed on the butt end of the fiber; the frayed ends opposite have broken off as golden-brown oval bodies (x200).

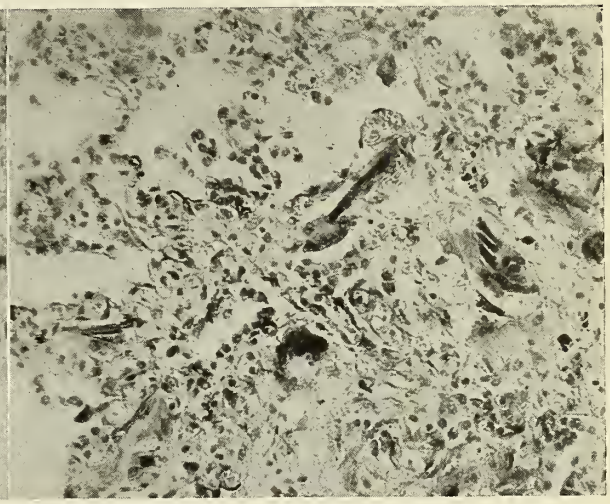


Fig. 4. A group of asbestos fibers surrounded by giant cells. Their golden-brown color distinguished them from fibers of elastic tissue, which stained more of a lilac color with hematoxylin and eosin. The asbestos fibers were frequently thicker and more irregular in outline, and remained unchanged in color with the ordinary aniline dyes (x150).

or lay close to fibers in various stages of dissolution. There was a central, darker portion, which probably represented the remains of a fiber, and which was not dissolved by nitric acid.[3] The outer, lighter brown covering, however, disappeared, and was thought to be a deposit of pigment of endogenous origin, probably

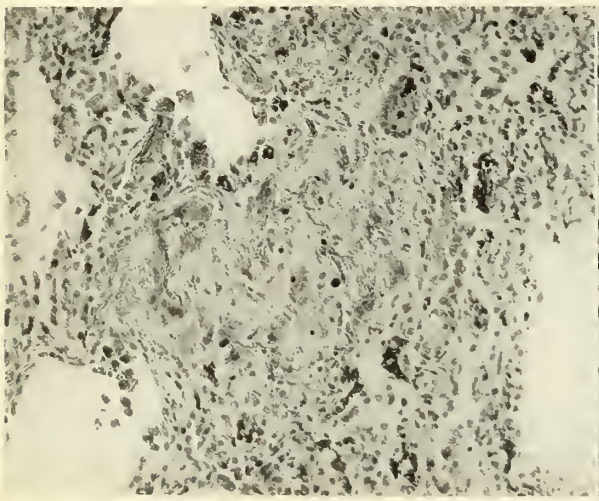


Fig. 5. A circumscribed nodule of fibrosis composed of fibrous tissue and giant cells in the midst of which lie partly degenerated asbestos fibers. The giant cell at the upper edge of the nodule contains several "asbestosis bodies" presumably in the stage of transition between a continuous fiber and the golden-brown oval bodies (x200).

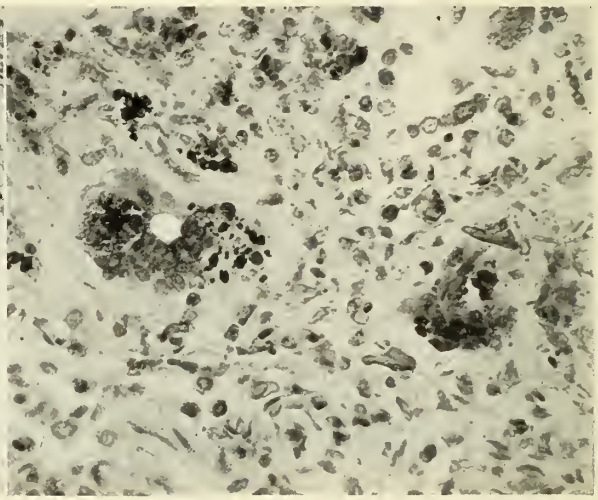


Fig. 6. Two giant cells with inclusions. The one on the right contains a bit of golden-brown asbestos within it, and there is also one above and one below the cell. The cell on the left contains numerous golden-brown bodies and a large vacuole in which lie more of these bodies, together with granules of hematogenous pigment. The tissue is markedly fibrotic (x450).

derived from the blood. It did not take a Prussian blue stain, although there is reason to believe that it contained iron in the form of one of the higher oxides. These golden-brown oval bodies were not birefringent under polarized light. They were believed to represent the end stage of disintegration of fibers of which an intermediate stage has been described by Cooke,[1,2] and by McDonald as "curious bodies" and by Stewart and Haddow as "asbestosis bodies." These men saw cases of more intense nature, and fibers that had not been exposed to the tissues for such a long period of time. The oval bodies did not stimulate the foreign-body reaction to such a marked extent as did the incompletely disintegrated fibers, but were scattered in clumps or singly through regions of mature connective tissue. This may be attributed to the cessation in the release of silicic acid in the colloidal form, a process that is believed to explain the fibrosis in cases of silicosis. Asbestos is a silicate, and hence presumably subject to the same dissolving process that affects particles of pure silica in the production of silicosis.

The ordinary "heart failure cells" presented the usual morphology and staining reactions. Occasional cells of the same general nature as the heart failure cell were found, measuring 100 to 150 microns in diameter. They contained only blood pigment, a few golden-brown oval bodies, bits of degenerated elastic fibers, or any combination of the three.

Perhaps the most valuable feature of this case is the extreme length of time that elapsed between the exposure to the dust and death. A few particles of silica were detected in the tissues and in the residue after oxidation with the acid, but not enough to explain the fibrosis which was present. Apparently once asbestos dust enters the lung it continues to injure the tissues as long as the person lives. In short, asbestosis is an incurable disease, and one from which the patient may or may not die. Intercurrent disease has been found in other reported cases to be unusually frequent, especially tuberculosis and bronchopneumonia. Neither were present in this instance, and death occurred from hypertensive heart disease, with complete heart block. This complication has not been mentioned before in this connection.

There is no reason to believe that the hypertension was directly connected with the pulmonary asbestosis, but the extreme dilatation of the right side of the heart is probably attributable to the fibrosis of the lungs. Passive congestion of the lungs is to be considered as a complicating factor, and may have operated in preventing a possible tuberculous infection. Auricular fibrillation was associated with the cardiac decompensation, and the heart block was probably of similar origin. Infarction of the heart was not found, and only the fatty changes in the myocardium were discovered which also involved the bundle of His. Colloidal silica has been found in previous studies[4] to be injurious to other viscera, especially the kidneys, but in this instance such alterations were not marked. The heart block, then, can hardly be attributed to this toxic factor.

SUMMARY

A case of pulmonary asbestosis, found in the United States, and of at least seventeen years' duration, is described. Pertinent clinical and pathologic details are given. This report corresponds reasonably well with reports from Great Britain.

39 South Main Street.

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METATONE NOT ACCEPTABLE FOR N. N. R.

Shotgun tonic mixtures were very popular a generation ago and some received more or less official recognition by being included in the National Pharmacopeia. In recent years these tonic mixtures have deservedly fallen into disuse, although included in the line of preparations of many manufacturers. Occasionally an effort is made to revive the use of such tonics by the addition of an ingredient the use of which has become a current fad. One of the recent attempts in this direction is the exploitation by Parke, Davis & Co. of a typical shotgun tonic mixture, modernized by the addition of "Vitamin B extract." This preparation, known as Metatone, is stated to have the following composition: alcohol, 1 per cent; Vitamin B extract per fluid ounce, 10 grs.; nucleic acid, 2 grs.; calcium glycerophosphate, 4 grs.; potassium glycerophosphate, 4 grs.; sodium glycerophosphate, 2 grs.; manganese glycerophosphate, ½ gr.; strychnine glycerophosphate, 8/200 gr." The statement as to the amount of "Vitamin B extract" is meaningless and gives no indication as to the actual amount of Vitamin B present, and there appears to be no good reason for giving it along with the other constituents of Metatone. Most of the other constituents of Metatone have long since been discredited as useful therapeutic agents. The Council on Pharmacy and Chemistry declared Metatone unacceptable for New and Non-official Remedies because it is an unscientific mixture, marketed under a proprietary name with unwarranted therapeutic claims. (Jour. A. M. A., May 3, 1930, p. 1405.)

ELECTRIFIABLE PLATES

The Post Office Department reports that J. M. Hughes, his wife, Mrs. J. M. Hughes, and his daughter, Essie I. Hughes, all of Atlanta, Ga., have for some time been defrauding the public under the trade name "Electrifiable Company" in the sale of so-called heel plates. These plates were crudely cut from sheets of copper and zinc. They cost 25 cents a pair; they sold at $5 a pair! It was claimed that, when worn in the shoes, the plates would cure hardening of the arteries, high blood pressure, enlargement of the heart, kidney trouble, hardening of the prostate gland, diabetes, rheumatism and dropsy! The Postmaster General issued a fraud order against the Electrifiable Company and J. M. Hughes. (Jour. A. M. A., May 3, 1930, p. 1427.)

USE OF THYROID IN OBESITY

The use of thyroid in obesity should always be controlled by a previous basal metabolism test. If this is normal or subnormal, it is safe for a physician to use thyroid. The best practice is to start with small doses of desiccated thyroid (Thyroideum, U. S. P.) gradually increasing. The small dose would be approximately 0.03 Gm. (½ grain) twice a day. The physician must keep a sharp lookout for fast pulse, nervousness or other symptoms resulting from thyroid stimulation. An obese person should not expect reduction by thyroid unless his diet is restricted, and when dietary restrictions are followed thyroid is not needed as frequently. (Jour. A. M. A., May 31, 1930, p. 1784.)

President's Letter

THE time will never come when the members of the medical profession will cease to seek for more knowledge. They always have done so. They always will do so. That is why they tend to locate where there are other doctors. It is why they establish offices near together, even in the same buildings. It is why they establish medical societies and why they visit medical centers.

So strong is this desire to acquire additional information that they will abandon their work and go from home, often at great expense, to take post-graduate courses of study. When they are not in a position to go away often enough, or stay away long enough, they band together and bring educational courses to their own communities, as witness our extension courses. Perhaps the keynote as to the kind of information sought by these busy men is expressed by the words authoritative and practical.

The program committee of the State Association has borne the latter fact in mind in making up the program to be presented at the meeting in Duluth in July. Every effort has been made to place men on the program who, by virtue of experience and training, can speak authoritatively and who will discuss their various subjects in a lucid and practical manner.

The association has been especially fortunate in its guest speakers. Such men as Prof. Boehler of Vienna, who has revolutionized the treatment of fractures, Prof. Franz Volhard of Frankfort on Main, of kidney fame, W. T. Longcope of Johns Hopkins, Karl Meyer of Northwestern University, Chicago, Ralph Kinsella of St. Louis, E. C. Davidson of Detroit, Michigan, Arnold S. Jackson of Madison and R. S. Dixon of the Detroit Department of Health are generously contributing their services.

There will be symposia. There will be a large range of subjects discussed by trained men affiliated with our institutions of learning, by men who are teaching, by others engaged in clinical work, in private practice. Still others will discourse upon the work of our state institutions. There will be lectures on preventive medicine and a whole evening will be devoted to economics.

The program is alive, up-to-date and thoroughly practical. It offers a tremendous lot of material in a form easy of assimilation. It offers an opportunity to acquire a great fund of medical knowledge within a three-day period. All can afford to come. None can afford to stay away.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

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Vol. XIII July, 1930 No. 7

THE ANNUAL MEETING

On to Duluth! Glance at the program of the scientific addresses which appears in this number of the journal and make your plans accordingly.

In former years it was the custom to limit guests from without the state to one or two, the program having been reserved for home talent. In recent years more and more outside talent has been imported and undoubtedly is an attraction. We like to see and hear and meet those whom we have known by reputation only. There is no question but that this phase of most medical meetings is their real *raison d'etre*. The addresses themselves are usually published and can be better digested when read at leisure. The broadening effect of widening one's acquaintance is fully as important as the renewal of acquaintanceship.

Most of us have heard of our distinguished visitors. Who does not know of Volhard by reputation? He is to include the State meeting with his participation in the Kidney Symposium at the University July 7 to 18, and will address the meeting on his favorite subject, the kidney. The tannic acid treatment of burns, which has attracted some international attention, will be presented by its originator, Dr. E. C. Davidson of Detroit. The visit of Professor Lorenz Boehler to this country has attracted considerable attention in medical circles. His reduction method of fractures under local anesthetics and early mobilization of the patient with a special cast and support, will be presented at the meeting.

The scientific exhibits at medical meetings in general have been growing in importance and interest. The display at last year's state meeting was most interesting. To stimulate interest in this part of the scientific program the Southern Minnesota Medical Association has offered a medal for the best scientific exhibit submitted. The exhibits from the Mayo Clinic are excepted.

The scientific program this year will for the first time occupy three full days. Last year local clinics served to fill out the three convention days.

The House of Delegates will meet Monday and Tuesday afternoons. The following Reference Committee has been appointed:

J. R. Manley, Duluth
W. F. Braasch, Rochester
E. M. Hammes, Saint Paul
C. P. Robbins, Winona
C. B. Wright, Minneapolis

The adoption of the Reference Committee method of handling committee reports and resolutions has proved highly satisfactory in expediting the transactions of the House of Delegates.

Shall we meet in Duluth?

THE DOCTOR AS A CITIZEN

The writer has had the opportunity, on the occasion of the meeting in Duluth of the Minnesota League of Municipalities, to hear one of our own active memers, Dr. O. E. Locken, Mayor of Crookston, talk on our affairs to lay audiences. Most of us know of the great interest Dr. Locken has had in various health movements; few of us hear him when he presents to laymen a sane, conservative expression of our medical objectives and an outline of community responsibilities.

It is a pleasure to pay tribute to his consummate skill. We may gain a few points through favorable legislation; we may fortify our professional position by industrious collectivism; but we shall never maintain economic and directional independence unless we are able to sense the times. In the matter of community life doctors expect over much, to be accepted as they are, mantled with a state-given prerogative which virtually amounts to a monopoly. Not always do we attempt to repay the community in which we live by entering fully into the daily movements which are its life.

We like to think that our government exists at our will. But it is rarely indeed that the public really expresses its opinion in anything like mass voting. After elections we drift and criticize our electorate near and far with an abandon that makes office holding and politics something contemptuous or worse. Yet Dr. Locken shows that we have definitely asked our governmental agencies to do endless things for us, few of which we would be willing under any circumstances to see abandoned. Population shifts, pauperism, unemployment, old age pensions, increasing accidental death rates, all present issues that strike closely to the core of the problem of making available to the mass of our population the scientific facts already proven to prolong life and make it worth while. We cannot withdraw into cloistered atmospheres, cheered only by our medical jargon and fancy that a divine right shall entitle us to perpetual leadership and public approval. Such men as Dr. Locken show us the way to a type of citizenship exemplifying an adaptation of our professionalism to our turbulent age.

E. L. T.

THE PRESENT MORALE IN ATHLETIC TRAINING

There is considerable food for thought in an article entitled Booze Beats Our Athletes, by Charley Paddock in the June 14th Collier's Weekly. The author, an athlete himself, is in a position to know, first hand, the present situation in athletic training in high school, college and Olympic teams.

While American athletes may never have shown the superiority in athletic events requiring great endurance that they have shown in the shorter races and events requiring more of the element of skill, the author calls attention to the definite slump in the number of our victories in the Olympic games since so-called prohibition was enacted. Since the war we have not won a single victory in races longer than the quarter mile and this is apparently not because of any demonstrable improvement in the status of athletics in other countries. He attributes the slump to the failure to maintain training, particularly as to the use of alcohol. The numerous incidents which came under his observation of drinking and that to excess, not only during training season but even before a race, are startling. The lack of moral stamina necessary to keep strict training as far as the use of strong drink is concerned, is nation-wide in its distribution and has affected high school, college and international athletics.

The general psychological effect of prohibition has apparently invaded the realm of athletics and the change of public sentiment in regard to the use of liquor has seriously interfered with the morale of athletic training. Before prohibition the athlete who broke training during season by taking a drink of liquor had to contend with the pressure of undergraduate or public opinion, which was so strong that such an offender knew in advance that he would likely be dismissed from the team. Apparently not so now. The lack of moral backing seems to have rendered trainers helpless.

The self-indulgence and disregard for authority manifest everywhere is naturally imitated by the youth of the country and this is the most serious psychological effect of the prohibition law.

OF GENERAL INTEREST

Dr. R. S. Ylvisaker, formerly of Minneapolis, is now located in Fergus Falls.

Dr. E. V. Goltz of Saint Paul was married June 18 to Miss Edith Allen of Minneapolis.

Dr. John F. Madden has opened offices at 842 Lowry Medical Arts Building, Saint Paul, for the practice of diseases of the skin and syphilis.

Summer clinics sponsored by the Chicago Medical Society will be held at the Cook County Hospital, Chicago, August 11 to 22, inclusive.

Dr. R. J. Moe, associated with Dr. W. A. Coventry in the Duluth Clinic, Duluth, spent six weeks in March and April in the New York Lying-In Hospital.

It is reported that Dr. Daniel D. Murray of Duluth has recently been married to Mrs. Blanche Kemerer Lord in Minneapolis. Dr. Murray has long practiced in Duluth, and was at one time City Health Commissioner.

Announcement has been received of the marriage of Dr. Wallace I. Nelson and Miss Gertrude Bergerud, which took place in Minneapolis May 27, 1930. Dr. and Mrs. Nelson are now at home in Underwood, Minnesota.

St. Luke's and St. Mary's hospitals, Duluth, report a very successful combined staff meeting for both hospitals for their regular March meeting. This time saving combination of necessary staff meetings promises well, according to staff members.

Dr. A. J. Henderson of Kiester, Minnesota, is taking a post-graduate course in pediatrics at Harvard Medical College, Boston. His practice is being cared for by Dr. D. M. Daley of Lewiston, Minnesota, a recent University of Minnesota graduate.

Dr. P. F. Eckman, an associate in medicine in the Duluth Clinic, Duluth, recently returned from an Eastern trip to New York, Philadelphia and Ann Arbor. He devoted his studies exclusively to hematology. He reports the field of study of secondary anemias a most unsettled one at this time.

Dr. A. T. Laird of Nopeming, with Mrs. Laird, attended the recent meeting of the National Tuberculosis Association at Memphis, Tennessee. Following the meeting they traveled to the Ozarks, where they visited with relatives. They report the Ozarks to be a wonderland at this time of year.

Ragnar Westman was awarded the medal offered by the Southern Minnesota Medical Association for the most proficient work in the clinical field of medicine and surgery during junior and senior years at the University Medical School. The awarding committee consisted of the Professors of Surgery and Medicine and the Dean of the Medical School.

Dr. E. L. Tuohy of Duluth presented the subject "Non-Tuberculous Lung Lesions" to the April meeting of the Pine-Chisago Medical Society held at Pokegama, and also to a combined meeting of the South Dakota and Sioux Valley Medical societies held at Sioux Falls, South Dakota, May 21 and 22.

The Minnesota State Medical Association has been invited by the Inter-State Postgraduate Medical Association of North America to be represented at the International Assembly of the Association in Minneapolis, October 20 to 24, by a scientific exhibit. Complimentary exhibit space is offered through Edwin Henes, Jr., Executive Secretary of the organization.

Dr. E. I. Lindgren, formerly of Duluth, now living in Finland, has returned to Duluth for a short visit. He practiced in Duluth for a number of years, but returned to his home country about three years ago. He reports Finland in a prosperous condition. He has traveled extensively in Europe, devoting his studies as well as his practice in Finland to roentgenology.

Dr. and Mrs. H. W. Froehlich, Thief River Falls, sailed, June 13, for Europe on the steamship Duchess of York, to travel until September. They first will visit England, then to Paris, from there to Frankfort, Berlin, Dresden, Munich, Oberammergau to see the Passion Play. From Oberammergau they will go to Vienna, Budapest and through the Tyrols. Dr. Froehlich will spend most of his time in Vienna studying the latest developments in surgery at the clinic.

F. Manley Brist, Investigating Attorney for the State Board of Medical Examiners, addressed a luncheon meeting of the Kiwanis Club at Willmar June 24 on current results of medical legislation sponsored by the State Association. In the evening he talked to the Kandiyohi-Swift County Medical Society on related medico-legal affairs. Mr. Brist will be a guest speaker at the annual meeting of the Wabasha County Medical Society to be held in Wabasha, July 10.

The Minnesota Society of Internal Medicine has again offered a prize of $250 to be awarded for the most worthy research work by a Minnesota physician, exclusive of members of the society. These should be submitted before October 1, 1930, to Dr. E. T. F. Richards, Hamm Building, Saint Paul, chairman of the award committee. Previous winners of the prize are Adolph Hanson, Faribault, 1927; Max Seham, Minneapolis, 1928, and Anderson C. Hilding, Duluth, 1929.

Dr. O. E. Locken, Crookston, presented the evening program of the Trail and Steele County Medical Society of North Dakota, May 1, at Northwood, North Dakota. He addressed the society on the subject of "Newer Phases in the Treatment of Heart Disease." Dr. Locken also gave the commencement address at the graduation exercises of the Nurses Training School of Trinity Hospital, Minot, North Dakota, May 12. Twenty-two nurses graduated from this new two hundred bed hospital.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Thank You, Mr. Rockne!

Knute Rockne is not a doctor. Probably, being one of the more illustrious and resourceful of famous football coaches, he doesn't even owe any doctors.

But here is his opinion of the profession reprinted from one of the popular Rockne columns called "Campus Comment" in the daily papers. It is of interest because Mr. Rockne is Mr. Rockne—because, as football coach, he has had some intimate dealings with doctors, and because he represents the more enlightened personages among the laity whose observations are worth something.

Perhaps Mr. Rockne's paragraphs will also come to the attention of certain popular magazines that have been occasionally given to airing other opinions on the subject of physicians. Mr. Rockne says:

"John Mohardt, one of my old halfbacks who used to team in the backfield with George Gipp, Paul Castner and Norm Barry back in 1920, is at Rochester. In another six months he will have finished his three year fellowship.

"John went four years to Notre Dame to get a B.S. degree; four years to Northwestern to receive an M.D., has spent two years in a hospital as an interne and then three years as a fellow in the clinic. Thirteen years of study since leaving high school before he feels he is ready.

"John will be 32 by the time he begins to be productive and the chances are that even then his earnings for the first few years will be rather slim.

"A terrific training for a young man. No other profession is nearly so exacting. I have been wondering what makes young men want to go into the practice of medicine with all its grief, endless hours, long preparation and what-not. It has been my observation that the good doctors have a sort of spark in their eyes, whereas many other professions interest men from the standpoint of monetary reward, easy livelihood, soft berth, prestige, or a stepping stone to something else.

"This can never be said of medicine. Medicine apparently is all-absorbing and occupies all of a man's wakeful moments and even some of the others.

"I have tried to analyze some successful doctors and I find that all of them have personality, ability, honesty, capacity for work, a burning zeal toward perfection in his chosen specialty, and intense responsibility regarding the human lives he is taking care of."

Results!

The improved state of mal-practice legislation in Minnesota, brought about largely through the efforts of the Minnesota State Medical Association, is showing very practical results to the physician.

A reduction of seven dollars in physician's mal-practice premium has just been announced by the Aetna Life Insurance Company, effective May 1, 1930.

For coverage of $10,000 to $30,000, the premium is now $21, instead of $28. This is the charge previously made for half the coverage.

Glenn Frank's Great Doctor

The great doctor must know almost as much about the social order as the sociologist. This is necessary because the varied forces—political, social, economic, industrial, educational, religious—that march across a nation, making its mind or marring its spirit, register their effects in the lives of the doctor's patients. The more the doctor knows about these forces that make the atmosphere in which men's minds and bodies live, the more intelligently can he trace effects to their causes, and the more wisely can he counsel his patients.

The great doctor must know almost as much about the mind as the psychologist. This is necessary because even the most materialistic scientist admits that there is a subtle relationship between mind and body that the doctor of the body dare not overlook, for when he does overlook this relationship a thousand quacks rush in to capitalize his oversight.

The great doctor must know as much about the subtle art of counselling as the priest.

The great doctor must refuse to be party to the ironic paradox of commercializing a profession just when the professionalization of commerce begins to dawn.

The great doctor must decline to tear his specialism out of the living texture of the whole medical fabric. He will not allow the noble science of surgery, for instance, to degenerate into a merely higher carpentry.

And, finally, the great doctor must be able to distinguish between Hippocratic ethics and hypocritic etiquette in matters professional.—*Glenn Frank, President, The University of Wisconsin, in Surgery, Gynecology and Obstetrics.*

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION



Dr. W. T. Longcope, Professor of Medicine, Johns Hopkins, Baltimore, who is to address the Minnesota State Medical Association at the Annual Meeting in Duluth.

PROGRAM

62nd Annual Meeting
MINNESOTA STATE MEDICAL ASSOCIATION
Sunday, July 13, 1930, 6:30 P. M.
Meeting of the Council
English Room, Hotel Duluth
Monday, July 14, 1930, 2 P. M.
Meeting of the House of Delegates
English Room, Hotel Duluth
Registration and Meeting Headquarters—Duluth Hotel

Monday Morning—July 14—8:30 A. M.
Ball Room, Hotel Duluth

PRESIDING OFFICERS

Section on Medicine

F. A. Willius, M.D.....Rochester
Edgar T. Herrmann, M.D.....Saint Paul

Section on Surgery

J. M. Hayes, M.D.....Minneapolis
W. N. Graves, M.D.....Duluth

SYMPOSIUM ON TRAUMATIC SURGERY

Health Education
F. H. Magney.....Duluth

Wounds of the Chest *(lantern slides)*
B. F. Davis.....Duluth

Costochondral Graft for the Repair of Skull Defects *(lantern slides)*
A. M. Hanson.....Faribault

Head Injuries *(lantern slides)*
Wm. McK. Craig.....Rochester

Reduction of Compression Fractures of the Vertebra *(lantern slides)*
E. T. Evans.....Minneapolis

Treatment of Fracture of Hip—Whitman Method *(lantern slides)*
Emil Geist.....Minneapolis

Fractures of the Lower End of Tibia and Fibula *(lantern slides)*
V. P. Hauser.....Saint Paul

The Treatment of Tetanus and Gas Gangrene *(lantern slides)*
M. H. Manson.....Minneapolis

Acute Traumatic Surgery of the Abdomen
Karl Meyer.....Chicago
Associate Professor of Surgery, Northwestern University; Medical Superintendent, Cook County Hospital.

Address: Fractures *(moving picture demonstration)*
Primarius Lorenz Boehler.....Vienna
Chief Surgeon Director, Vienna Accident Hospital.

Monday Afternoon—July 14

The Treatment of Neurological Changes in Pernicious Anemia
W. T. Longcope.....Baltimore
Professor of Medicine, Johns Hopkins.

Address: Treatment of Nephritis
Franz B. Volhard..Frankfort-on-the-Main, Germany
Professor Internal Medicine and Director of City Hospital.

SYMPOSIUM ON IMMUNOLOGY

Poliomyelitis and Measles
C. A. Stewart.....Minneapolis

Diphtheria and Scarlet Fever *(lantern slides)*
W. Ray Shannon.....Saint Paul

Cerebro-Spinal Meningitis *(lantern slides)*
Carl O. Kohlbry.....Duluth

Pneumonia
E. P. Reiman.....Buffalo

The Problem of Allergy
W. P. Larson.....Minneapolis

OUR STATE INSTITUTIONS

Feeble Minded, Blind and Deaf
J. M. Murdoch.....Faribault

Tuberculosis
Arnold S. Anderson.....Saint Paul

Epileptic Colony
D. E. McBroom.....Cambridge

University Hospital *(lantern slides)*
Mr. Paul Fesler.....Minneapolis

Gillette State Hospital *(moving picture demonstration)*
C. C. Chatterton.....Saint Paul

Insane
A. F. Kilbourne.....Rochester

Monday Evening—July 14—7:30 P. M.
Ball Room, Hotel Duluth

MEDICAL ECONOMICS MEETING

E. A. Meyerding, *Chairman*

THE ECONOMIC TREND OF MEDICINE

The United States Veterans' Bureau, Its Place
N. S. MacDonald.....Minneapolis
United States Veterans' Bureau.

The Increasing Importance of the Medical Reserve
Col. George A. Skinner, M.C.U.S.A.....Omaha
Surgeon, Seventh Corps Area.

The Place of the Local Hospital
Mr. Paul Fesler.....Minneapolis
Superintendent, University Hospital.
The Doctor's Wife
Mrs. J. D. Lyon.....Minneapolis
President, Women's Auxiliary, Minnesota State Medical Association.
The Place of the Local Medical Society
Mr. Wm. J. Burns.....Detroit
Executive Secretary, Wayne County Medical Society.
In Wisconsin
Mr. J. G. Crownhart.....Madison
Secretary, Wisconsin State Medical Society.
In Middle West
John H. Peck.....Des Moines
President, Iowa State Medical Society.
What Is It?
Olin West.....Chicago
Secretary, American Medical Association.

Tuesday Morning—July 15—8:30 A. M.
Ball Room, Hotel Duluth

SYMPOSIUM ON EARLY DIAGNOSIS AND TREATMENT OF MALIGNANCY

Stomach *(lantern slides)*
Leo G. Rigler.....Minneapolis
Mouth and Lip *(lantern slides)*
F. A. Figi.....Rochester
Uterus
W. A. Coventry.....Duluth
Colon *(lantern slides)*
F. W. Rankin.....Rochester
Rectum
A. C. Strachauer.....Minneapolis
Breast *(lantern slides)*
O. J. Campbell.....Minneapolis
Urogenital Tract *(lantern slides)*
Walter Walters.....Rochester
Discussion
W. J. Mayo.....Rochester

Evulsion of the Phrenic Nerve for Pulmonary Tuberculosis *(lantern slides)*
Everett K. Geer.....Saint Paul
Some Clinical Features of Chronic Pulmonary Fibrosis *(lantern slides)*
A. T. Laird.....Nopeming
Acute Appendicitis—Causes of Death
A. L. McDonald.....Duluth
Intra-Abdominal Abscess *(lantern slides)*
P. E. Stangl.....Saint Cloud
Cinematograph Demonstration of Living Tissue Cells Growing in Vitro *(Canti)*

Tuesday Afternoon—July 15

SYMPOSIUM ON RHEUMATIC FEVER

Bacteriologic Studies *(lantern slides)*
B. J. Clawson.....Minneapolis
In Childhood
H. F. Helmholz.....Rochester
Carditis
Max Hoffman.....Saint Paul
Visceral Manifestations *(lantern slides)*
E. L. Gardner.....Minneapolis
Non-Articular Forms
Harry Oerting.....Saint Paul
Special Consideration of Etiologic Factors
Ralph Kinsella.....Saint Louis
Professor of Internal Medicine, St. Louis University.

Extra-Uterine Pregnancy
J. C. Masson.....Rochester
The Economic Importance of Squint in Children and Its Effect in After Years *(lantern slides)*
F. N. Knapp.....Duluth
Vaginal Hernia with Report of Two Cases Operated *(lantern slides)*
E. K. Green and L. K. Buzzelle.....Minneapolis
Further Results of the Treatment of Pernicious Anemia with Swine Stomach *(lantern slides)*
H. M. Conner.....Rochester
Acute Bowel Obstruction *(lantern slides)*
O. H. Wangensteen.....Minneapolis
Fractures of the Pelvis *(lantern slides)*
Owen W. Parker.....Ely
The Practical Value of an Examination of Blood Smears *(lantern slides)*
C. H. Watkins and F. J. Heck.....Rochester
Circulatory Tests Before Amputation
W. T. Peyton.....Minneapolis

Wednesday Morning—July 16—8:30 A. M.
Ball Room, Hotel Duluth

SYMPOSIUM ON ANESTHESIA

Use of Barbiturates in Surgical Procedures *(lantern slides)*
C. F. Dixon.....Rochester
Spinal Anesthesia *(moving picture demonstration—lantern slides)*
Arnold S. Jackson.....Madison, Wisconsin
Eye, Ear, Nose and Throat Anesthesia
L. W. Morsman and Andrew Sinamark.....Hibbing
The Principles of Administering Local Anesthesia with Moving Picture Demonstration
R. E. Farr.....Minneapolis
S. R. Maxeiner *(lantern slides)*.....Minneapolis
General Anesthesia—Complications *(lantern slides)*
Ralph Knight.....Minneapolis

Installation of Officers
Cranial Nerve Palsies *(lantern slides)*
L. H. Ziegler.....Rochester
Sodium Amylethyl Barbiturate in Psychiatry
L. R. Gowan.....Duluth
Recurrent Lymphangitis
W. H. Goeckerman.....Rochester
A Discussion of Some Clinical Features of Obstructive Jaundice *(lantern slides)*
Albert M. Snell and F. M. Jordan.....Rochester

Wednesday Afternoon—July 16

SYMPOSIUM ON THERAPY

The Problem of Disease of the Paranasal Sinuses *(lantern slides)*
H. I. Lillie.....Rochester

Use of Tannic Acid in Burns of Children *(lantern slides)*
E. C. Davidson.....Detroit
Attending Surgeon, Children's Hospital of Michigan; Junior Surgeon, Harper Hospital.
Common Foot Disorders
A. E. Flagstad.....Saint Paul
The Physician's Coöperation in Public Health Administration
F. E. Harrington.....Minneapolis
Clinical Hypothyroidism
Frederick H. K. Schaaf.....Minneapolis
Encephalitis
W. H. Hengstler and G. N. Ruhberg.....Saint Paul
Skin Diseases *(clinic and lantern slides)*
H. E. Michelson.....Minneapolis
Hypertension *(lantern slides)*
N. M. Keith.....Rochester
Synopsis of Treatment of Chronic Arthritis *(lantern slides)*
George A. Williamson.....Saint Paul
Question Box
F. J. Hirschboeck.....Duluth
Henry L. Ulrich.....Minneapolis

A question box will be placed at the registration desk, and questions on therapy may be deposited therein at any time before 1 P. M. Wednesday. Discussion will be limited to five minutes.

THE ANNUAL BANQUET
Ball Room, Hotel Duluth
Tuesday Evening—July 16—6:30 P. M.
Toastmaster, W. A. O'Brien, Minneapolis

Address of Welcome
Mason Forbes.....Duluth
County Attorney, St. Louis County.
Introduction of Past Presidents and Foreign Guests.
Response
J. T. Christison, Past President.....Saint Paul
The Women's Auxiliary
President-Elect.
The State Association
S. H. Boyer, President.....Duluth
The President-Elect.
Dancing

WOMEN'S AUXILIARY OF THE MINNESOTA STATE MEDICAL ASSOCIATION
Monday, July 14

3:00—
Meeting of the State Executive Board.
Home of Dr. and Mrs. Ben. F. Davis, 2317 Woodland Ave.
3:00—
Boulevard drive leaving the Hotel Duluth for the Garden Party Tea.
4:00-6:00—
Garden Party Tea.
Home of Dr. and Mrs. Ben. F. Davis, 2317 Woodland Ave.
7:30—
Medical Economics Meeting.
Ball Room, Hotel Duluth.

Tuesday, July 15

10:00 A. M.—
Annual Meeting.
English Room, Hotel Duluth
Address
S. H. Boyer, President.....Duluth
The Women's Auxiliary and the Committee on Public Health Education
George Earl.....Saint Paul
The Importance of the Women's Auxiliary
Ralph Knight.....Minneapolis
1:00 P. M.—Business Meeting.
Luncheon and Program—Northland Country Club.
Cars will leave the main entrance of the Hotel Duluth at 12:30 P. M.
Toastmistress, Mrs. James Blake, Hopkins
President, Women's Auxiliary of the Hennepin County Medical Society
Responses
By the Presidents of the Component Auxiliaries
Heart
C. N. Hensel.....Saint Paul
Immunology
H. F. Helmholz.....Rochester
6:30 P. M.—Annual Banquet
Ball Room, Hotel Duluth.

OUR GUESTS

Primarius Lorenz Boehler.....Vienna
Prof. Franz Volhard.....Frankfort-on-the-Main
W. T. Longcope.....Baltimore
E. P. Reiman.....Buffalo
Mr. Wm. J. Burns.....Detroit
E. C. Davidson.....Detroit
Mr. J. G. Crownhart.....Madison
Arnold S. Jackson.....Madison
Ralph Kinsella.....St. Louis
Karl Meyer.....Chicago
John H. Peck.....Des Moines
George A. Skinner.....Omaha
Olin West.....Chicago

THE SYMPOSIUM ON THE KIDNEY IN HEALTH AND DISEASE

Since the preliminary program was issued the number of contributors to the Symposium has materially increased. Thus Prof. I. Snapper is coming from Amsterdam, Dr. J. Gamble from Boston, Dr. Jonas Friedenwald from Baltimore, etc. It will be possible to give a presentation of the following topics.

The anatomy of the kidney will be presented in a way which might be considered characteristic of the present-day trend in American anatomy. The physiology of the kidney will be treated with considerable fullness and with close correlation between form and function.

The chemical processes taking place in the kidney usually do not receive much attention but will here be given separate consideration. The clinical ways of testing kidney function will be discussed in detail, particularly the new urea and creatinine tests.

The clinical aspects of Bright's disease will be presented at length in a series of clinics, for which several doctors outside the University clinics have kindly

contributed valuable material. The pathological changes occurring in the kidneys will be described and the nature of the pathological processes discussed. The degree of correlation existing between anatomical lesions and the clinical pictures of Bright's disease will provide the topic for a round table discussion. Borderline cases between harmless albuminuria and Bright's disease will be presented and discussed. Albuminuria itself will be discussed both as to its chemical nature and in regard to its effect upon the blood proteins. The newer clinical tests for albumin will be demonstrated and evaluated.

The edema problem will be treated at some length. The same will be the case with the topic of uremia. The treatment of the convulsive type of uremia will be given special consideration. The eye changes in Bright's disease will be diagnosed and discussed at considerable length both as to their diagnostic and prognostic significance. Special discussion will be given to the chapter of hypertension. The general treatment of the diseases of the kidney will be outlined and the nature of the effect and the specific use of diuretics will be presented in detail.

The number of round table discussions has been increased so as to give every opportunity for the presentation of different points of views. A number of medical clinics in U. S. A. and Canada will be represented at the round tables and their experiences will be communicated.

An exhibition of older works dealing with the kidney has been arranged in the University Library by Dr. S. P. Miller of the Department of Anatomy.

A report containing the essential material presented during the Symposium will be published as an independent volume as soon as possible after the Symposium.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

Duluth entertained the membership of the Minnesota Society of Internal Medicine for its semi-annual meeting Monday, May 26. Out of a membership of about fifty over 80 per cent were in attendance. The program was a very intensive one, made up of twenty-one presentations, all by members.

At a banquet session in the evening Dr. Anderson Hilding (formerly of Duluth, now of Rochester, Minnesota) presented his prize winning thesis dealing with "The Common Cold."

Dr. E. L. Tuohy presided at the meeting and banquet.

DAKOTA COUNTY MEDICAL SOCIETY

Preparations for organization of a Dakota County Medical Society were begun by eight Dakota County physicians at Hastings, Monday, June 9.

Dr. E. A. Meyerding, secretary of the State Association, and Dr. F. J. Savage, councilor of the district, were present to assist in organization. They will present application for a charter for the new society to the House of Delegates at the annual state meeting in Duluth, July 14, 15 and 16.

With the organization of the Dakota County Society, only one county, Lake of the Woods, still remains unorganized or unaffiliated with some county medical organization in the entire state of Minnesota.

The Dakota County signers of the petition for a charter are L. D. and L. R. Peck, H. A. Fasbender, R. C. Radabaugh, Hastings; T. J. Gaffney, Lakeville; J. A. Sanford and G. A. Walter, Farmington, and W. T. Hagerty, Cannon Falls.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Scott-Carver County Medical Society officers elected at the annual meeting of the Society at Shakopee, June 10, for 1931 are: Dr. M. B. Hebeisen, president; Dr. W. S. Emmerson, vice president; Dr. C. F. Cervenka, secretary and treasurer; Dr. Fred C. Westerman, delegate; Dr. B. H. Simon, alternate, and Dr. M. B. Hebeisen, censor.

Dr. Frederic Foley, St. Paul, addressed the Scott-Carver meeting on various types of bladder neck obstruction and Dr. C. N. Hensel, St. Paul, talked on the heart. The July meeting of the Society will be held at Watertown by invitation of Dr. H. A. Halgren.

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of July will be as follows:

July 2—Vacation Time
July 9—Growth in Childhood
July 16—Cause of Hernia
July 23—Facial Neuralgia
July 30—Common Foot Disorders

RIVAL PROPHYLACTICS IN DIPHTHERIA

The early success with toxin-antitoxin in this country has given to it almost exclusive use in prophylaxis. There are, however, other effective ways of reducing the toxicity of diphtheria toxin besides partial neutralization with antitoxic serum. The products of these newer methods have been extensively used in Canada and in Europe. In the schools of Milwaukee from 1925 to 1928 the respective percentages of immunity achieved by the use of toxin-antitoxin were 85, 62, 75 and 69. With diphtheria toxoid better results were obtained, only 2 out of 128 giving positive Schick tests after treatment. Another claim in favor of diphtheria toxoid is that it does not result in sensitization to horse serum. However, it is not likely that toxin-antitoxin produces any noticeable sensitization; further, the toxin-antitoxin may be prepared with goat or sheep serum. Diphtheria toxoid would seem to be at least as valuable as diphtheria toxin-antitoxin mixture and in the pre-school child is probably to be preferred. (Jour. A. M. A., May 24, 1930, p. 1708.)

OBITUARY

Louis Leypoldt Moench

1875-1930

Dr. L. L. Moench, well known physician of Waterville, Minnesota, met death Monday afternoon, June 2, 1930, when a deer rifle which he was taking from his car was accidentally discharged. He was instantly killed when the bullet entered his body under the right arm and came out over his heart. The rifle was a 30-30 Winchester which had been purchased for the purpose of deer hunting. Death was instantaneous. The deputy coroner, Dr. Kolars, of Le Sueur Center, was called and gave his verdict that the shooting was accidental.

Dr. Moench, born Dec. 6, 1875, received his medical training at the Eclectic Medical Institute, now the Eclectic Medical College in Cincinnati, where he was graduated in 1903. He practiced at Monteith, Iowa, and at Kilkenny before moving to Waterville, where he had practiced for the past sixteen years.

Dr. Moench is survived by his wife and two sons, George 21, and Hubert 17.

Benjamin M. Randall

1858-1930

Dr. Benjamin M. Randall, a practicing physician at Graceville, Minnesota, for many years, died at his home May 24, 1930. Death was due to arteriosclerosis and cerebral hemorrhage.

Dr. B. M. Randall, son of Major B. H. Randall, was born at Fort Ridgely, Minnesota, on June 7, 1858. A few years later following the outbreak of the Sioux Indians in that region he moved with his parents to St. Peter, where he received his early education. He was graduated from Rush Medical College in 1883. After practicing a year in Graceville he left for New Ulm, but returned to Graceville the following year and has practiced here since that time. He is survived by his widow, Lenora Fallon Randall, four daughters, the Misses Willa and Esther Randall and Mrs. M. J. Goblirsch of Graceville and Mrs. F. A. Cummings of Minneapolis, and two sisters, Mrs. Leroy Foster and Miss Froelie Randall of Opalocka, Florida.

From the days of his coming to Graceville Dr. Randall has ever been a valued participant in the social life of the vicinity. He was a member of the Court of Honor, the Hibernian Society, and the Knights of Columbus as well as of numerous other groups organized from time to time for individual or civic uplift.

In the formation and development of the Old Settlers Association he had the keenest interest, ably assisting as he could with his vast fund of accurate historical information covering early Minnesota. Many have been the gatherings made incomparably richer by the gems of thought and sparkling wit reflected from his wealth of cultured background.

To the many now scattered associates of his early years in Graceville the very name of Dr. Randall recalls a host of poignant memories, and no mere words can serve to estimate their sense of appreciation of all that he has meant to them. A friend of later days makes mention of a never-to-be-forgotten period in his career when failure to be accepted among those enlisting for War service left him the sole responsibility of administering medical aid through a large territory during the ravaging "flu" epidemic of 1918, a work of sacrifice and heroism accomplished under almost impossible conditions. Thus, those who have come to know him in more recent times as well have not failed to be impressed by the unusual quality of his devotion to his chosen field, a profession privileged and made nobler still in having him as a symbol of its loftiest ideals.

George Ellsworth Chamberlain

1864-1930

Dr. George Ellsworth Chamberlain, well-known physician and surgeon of Aberdeen, Washington, and a practitioner for several years in Minnesota, died April 13, on the anniversary of the day in 1893 when he was graduated from the College of Physicians and Surgeons of Chicago, the medical department of the University of Illinois. His death came in his sleep and although he was stricken with a cerebral hemorrhage last May, his condition has been no more serious than before and his passing was a surprise to family and friends.

He is survived by his wife and two children, Samuel V. Chamberlain of Paris, France, and a daughter, Mrs. Walter Wiebenson, of Sausalito, California.

Dr. Chamberlain was born in Indiana July 8, 1864. From his earliest years he evinced a strong desire to become a physician and worked throughout his early years to attain that desire. Colonial ancestry on both sides of his family made him strongly patriotic. His grandparents were among the early settlers in Boone county, Kentucky, being located there at the time of the Revolution.

After his graduation with high honors from the medical college, he practiced in Wells, Minnesota, for two years. He located at Waterville, Minnesota, where he practiced his profession until 1902, later settling at Bismarck, N. D. He was married July 3, 1892, to Miss Cora Lee Summers at Richmond, Wisconsin.

Dr. and Mrs. Chamberlain moved to Aberdeen March 5, 1905, and have since resided in that city. He founded the Aberdeen General Hospital about twenty years ago and was its president until March 12, 1928. He was the first physician in the city to become a Fellow of the American College of Physicians and Surgeons, an honor which was very dear to his heart. He was a member of the Elks and of the Masons. He was a kindly, lovable man, understanding of young and old alike and ever faithful to his duty and ready to give of his sympathy and time.

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—A patient of mine has undulant fever according to the laboratories of the State Department of Health. The fever persists. I understand that you have a case at the University Hospital now. What treatment have you worked out? I would be very glad to try anything that is promising.

   Answer.—As far as we have been able to find, no specific treatment exists for undulant fever. The treatment is expectant. If the patient is losing weight, it is advisable to put him on a high caloric diet. Bed rest may be necessary because of fatigue and analgesics for pain. As a general rule patients with undulant fever feel fairly well and are able to do a limited amount of work. A vaccine is being tried at the present time, but the results are variable, and the reactions are said to be severe.

2. *Question.*—I would like to have a little advice on treating a case of gingivitis due to actinomycosis. The case is of about two years' duration. Diagnosis was made by the sulphur granules. At two different times these were placed under the microscope, and a typical filament formation was seen. The gums are involved on both the buccal and lingual surfaces along the incisors and cuspids of both the upper and lower jaws. During the past month I have had the patient using potassium iodide internally and tincture of iodine locally three times a week. The tincture of iodine was discontinued two weeks ago because it irritated the gums too much. I have just started the use of ultraviolet light on this patient, but have not had time yet to observe its effects. Any suggestions you have to offer in the treatment of this case will be appreciated.

   Answer.—Your patient probably has pyorrhea alveolaris. Fungi belonging to the actinomycosis group are found in this disease. They are not the pathogenic organism responsible for the disease as we know it in man and animal. The first essential in the treatment of pyorrhea is to avoid excessive local treatment. The mouth should be thoroughly cleansed daily and the gums massaged. A dentist should examine the mouth very carefully for evidence of malocclusion. The trauma incident to malocclusion often keeps up the trouble in the gums. If this can be corrected the mouth will often clear up without any further treatment.

3. *Question.*—A patient recently presented himself at the clinic for diagnosis giving a history of having passed large quantities of urine for several years and of consuming large quantities of water. The patient is ten years old, a male, underdeveloped and undernourished. The specific gravity of the urine is practically 1 and of very light color. A provisional diagnosis of diabetes insipidus has been made. I would like very much to know of any recent development in the treatment of this disease and would appreciate any suggestions that you may have to offer.

   Answer.—Pituitrin materially relieves the unpleasant symptoms of diabetes insipidus when given in daily injections of amounts determined by the tolerance of the patient. Such treatment is not curative, however. I would advise you to start out with a daily injection of pituitrin, graduating the dose according to the relief of symptoms. If the injections in the arm became painful, it may be used on pledgets of cotton placed in the nose. The urine should be carefully followed for any evidence of sugar which might appear at a later date. It would also be advisable to correct any disturbing emotional factors which may be present in the child's environment. Sometimes diabetes insipidus is precipitated by a fright or scare and relief of symptoms may be obtained in part by correcting environmental factors.

4. *Question.*—I have a case of headache in a young man, age 24, that has presented no little difficulty in diagnosis. The history follows: The patient had been working on a farm for several months. On Monday, June 2, he left the farm and started home. While on the train he began to complain of a throbbing frontal headache. This continued until Wednesday night, June 4, when I first saw him. The headache was extremely severe, but was relieved after an hour by ⅓ grain pantopon. Physical examination revealed essentially nothing abnormal; pulse 68, temperature 98.4, blood pressure 130/78, urine normal. There was a considerable amount of mucopurulent discharge from the nose which led to a tentative diagnosis of frontal sinusitis. On June 5, the patient felt well and was up and about all day, but about 8 P. M. he was suddenly taken again with very severe headache. He was crazy with pain, crying out in agony, pounding his head, and unable to lie still for more than a few seconds at a time. I stayed with him for several hours, and after he had had one grain of pantopon and 1/150 grain of hyoscine hydrobromide, he was slightly relieved. About 2:30 A. M. he had a generalized tonic convulsion (which I did not observe) that lasted for about five minutes. After that he dozed until morning. On June 6, he was admitted to the hospital. An ophthalmologist reported no error of vision and normal fundi. *X*-ray examination showed no pathology in the sinuses. A lateral stereo of the head was negative except for indefinite outline of the posterior clinoid process of the sella turcica. Spinal puncture gave a clear spinal fluid with cell count of 10. Spinal pressure was 9 mm. of mercury, and after removal of 15 c.c. of fluid the pressure was 6. Spinal puncture gave no relief from headache. Blood and spinal fluid Wassermanns negative. Leukocyte count 8,700. Patient remained in hospital until June 10. During his stay, the headache gradually subsided with with occasional doses of morphine and hyoscine. Since his discharge he has felt well. There is nothing in the family history or in the past history which throws any light on the case.

   Answer.—The headache does not resemble the usual attack of migraine. You have apparently ruled out sinus infection. Epilepsy does not

(Continued on Page 514)

MISCELLANEOUS

THE SCOPE AND AIM OF THE COMMITTEE ON THE COST OF MEDICAL CARE

At the spring meeting of the Committee on the Cost of Medical Care in Washington, May 2 and 3, 1930, a special committee of private practitioners was appointed to consider the relation of the committee to the private practitioners of the country. This committee, composed of the undersigned members, now submits the following statement for the information of these practitioners on the scope and aim of the committee's work.

It was clearly recognized by all present at the spring meeting that the committee has undertaken a program of studies which in its scope goes far beyond that part of the cost of medical care which physicians provide. The expense of several other kinds of service now looms large in the total cost of many illnesses. In addition, special emphasis was given at the meeting to the question of the adequacy of the various services available in a community. Finally, the committee adopted a statement of three fundamental principles proposed by the Chairman, which should go a long way toward reassuring those who have been apprehensive regarding the nature of the committee's ultimate recommendations.

I.

The committee is interested in far more than the physician's bill, which, in many instances, is considerably less than half the total cost of illness. Hospital care, nursing, dentistry, laboratory examinations and medicines often involve considerable expense, as is clearly shown by several of the committee's studies which are now being completed or have already been reported upon. In one middlewestern county recently surveyed, the expenditures for various kinds of medicines constituted over one-third of the total expense for medical care, and were 20 per cent greater than the costs of physicians' services. It is also becoming apparent that a great deal of money is being spent for useless medicines and for various irregular forms of treatment which do the patient no good or which may result in positive harm.

In order to indicate clearly the broad scope of the committee's work, it was decided at the spring meeting to make a slight change in its name. The word "cost" is to be changed to "costs." The complete name of the committee, with subtitle, will henceforth be "The Committee on the Costs of Medical Care—Organized to Study the Economic Aspects of the Prevention and the Care of Sickness, including the Adequacy, Availability and Compensation of the Persons and Agencies Concerned."

One vital problem before this committee, declared a prominent physician member, at the recent meeting, is the determination of what is reasonably adequate care. In many cases of obscure disorders and serious illness, expensive facilities are essential. Presumably, there must be available in the community well trained general practitioners, certain specialists, dentists, nurses, hospitals and health agencies—trained and well equipped to do their part in providing all the care that the individual may need. A plan of the executive committee, to conduct a study to determine standards of adequate medical care, under the general direction of some well-known competent physician and with the assistance of a committee of fifteen or twenty other physicians, was heartily endorsed at the meeting of the general committee.

The aim of the committee is to study the problem described by Dr. Olin West, the Secretary of the American Medical Association, as the one great outstanding problem before the medical profession today. This, he says, is that involved in "the delivery of adequate, scientific medical care to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life." The committee is endeavoring to establish a foundation of facts which have an important bearing upon this problem. On the basis of these facts, it will propose recommendations for the provision of adequate and efficient therapeutic and preventive service for all the people at a reasonable cost to the individual, which, at the same time, will provide physicians, dentists, nurses, hospitals and other agents assurance of adequate return. This is not a new statement of aim. Recent discussion, however, has given new emphasis to certain aspects of it. There are important items in the cost of sickness other than the physician's bill; and the adequacy of the service provided must be considered. The program of studies is a comprehensive one. It deals with questions of supply, demand, distribution and costs of all kinds of services, both preventive and curative; the relation of these costs to other expenses; the return accruing to the practitioners and various agents furnishing medical services; and especially will it seek to determine what standards of adequacy may reasonably be expected.

II.

Dr. Ray Lyman Wilbur, Chairman of the committee, proposed at the meeting May 2 a statement of three fundamental principles for the consideration of the committee. This statement was referred to each of four subcommittees which held sessions during the two-day meeting. The entire committee, at its last session, May 3, adopted with a few verbal changes the three principles. These will be of special interest to the physicians and dentists. They follow:

1. *The personal relation between physician and patient must be preserved in any effective system of medical service.*

Medical service is and doubtless, by its very nature, must remain a distinctly personal service. Even in this age of standardized commodities for the table, ready-to-wear clothing, and interchangeable spare parts for all types of machines, there has been no plan suggested for the reduction of medical diagnosis and treatment to basic units which can be ordered from travelling salesmen or acquired through correspondence courses. The physician must see his patient and see him, in many cases, over an extended period of time if the diagnosis and treatment are to achieve the greatest

possible accuracy and efficiency. There is no substitute for personal observation.

Man is not a standardized machine and each individual reacts to the conditions of life in a manner in some respects unique. In the treatment of disease, this individual variation is a factor of great significance and can receive due consideration only when the practitioner has known the patient for a considerable time and maintains a personal relation with the patient.

2. *The concept of medical service of the community should include a systematic and intensive use of preventive measures in private practice and effective support of preventive measures in public health work.*

The cost of adequate curative treatment is now high and may continue to increase as expensive procedures resulting from scientific progress become more widely used. Sickness, in addition, involves other personal and social costs, some of which cannot be measured in monetary terms.

The outstanding achievements in scientific medicine have been made in the preventive rather than the curative field. Knowledge now available for the control of malaria, tuberculosis, smallpox, diphtheria, pellagra, typhoid fever, hookworm disease, and goiter, if effectively applied, would make unnecessary a considerable proportion of the present expense for the cure of sickness.

3. *The medical service of a community should include the necessary facilities for adequate diagnosis and treatment.*

From the standpoint of effective diagnosis, many diseases, such as tuberculosis, cannot be recognized promptly in their early stages without the aid of elaborate technical equipment. From the standpoint of adequate therapy, if the best of modern technic is not immediately available, complete cures are either delayed or rendered impossible of attainment. To cite a specific illustration of the improvement of modern therapeutic procedures over those of ten years ago, the time required for treatment of fractures of the hip, and the percentage of permanent invalidity resulting from that injury have each been reduced by more than half.

We cannot be content with anything except the best possible service that modern science can provide and it is therefore imperative that modern scientific equipment for the diagnosis and treatment of disease be available to the practitioners of medicine in every community.

Special Committee of Private Practitioners.
Stewart R. Roberts, M.D., *Chairman*
Walter P. Bowers, M.D.
A. C. Christie, M.D.
Haven Emerson, M.D.
George E. Follansbee, M.D.
M. L. Harris, M.D.
J. Shelton Horsley, M.D.
Kirby S. Howlett, M.D.
Arthur C. Morgan, M.D.
Herbert E. Phillips, D.D.S.
C. E. Rudolph, D.D.S.
Richard M. Smith, M.D.
N. B. Van Etten, M.D.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
205 W. 2nd STREET, DULUTH
THOMAS A. PEPPARD,
MEDICAL ARTS BLDG., MINNEAPOLIS

THE CLINICAL SYNDROME OF HYPERPARATHYROIDISM: David P. Barr, M.D., and Harold A. Bulger, M.D. (Amer. Jour. of Med. Sci., April, 1930, p. 449). The authors review the literature relating to the experimental results obtained by the injection of excessive amounts of parathormone. The essential characteristic is a rapidly developing hypercalcemia. Symptomatically there is restlessness, respiratory distress, vomiting, diarrhea, hematemesis, melena, collapse and death. There is usually hematuria, and in the fatal cases the kidneys cease to function about the time that the maximum value of hypercalcemia is obtained. During the terminal period, the phosphates and the nonprotein nitrogen of the blood rise rapidly. They have collected from the literature and report in brief twenty-nine cases of parathyroid tumors. (These were summarized from the report of Hoffheinz.) In addition 74 examples of pathologically enlarged parathyroid glands included malignant and benign tumors as well as simple hyperplasia.

Conditions associated with enlargement of the parathyroid are nephritis, kidney stone, pituitary tumor, acromegaly, but most particularly diseases of the bones, and especially generalized osteitis fibrosa.

Of interest is the finding of metastatic calcification in the lungs, stomach, and kidneys.

Their own case reports, numbering five, include four female and one male, ages from 11 to 56. The first case is reported in great detail, and includes the operative removal of a parathyroid tumor. This surgical procedure caused a severe tetany, produced a hypocalcemia and a strongly positive calcium balance, and hyperphosphatemia. It prevented advance in the bone disease, and resulted in some subjective and objective improvement.

The second patient was also operated upon, and following operation the serum calcium fell below the normal level, and minor subjective symptoms of tetany developed. This patient was definitely improved.

The third patient died after some months.

(Autopsy and microscopic findings in cases four and

five.) The onset of the disease had occurred in childhood. The roentgen ray appearance of the bone was typical of osteitis fibrosa cystica. There was no evidence of hyperparathyroidism. The values for serum calcium were within normal limits.

Some others have found high values for blood calcium in the following conditions: abnormal ingestion of calcium, joint diseases, polycythemia, nephritis, multiple myeloma, carcinomatous metastases in bone, and osteitis fibrosa.

In summary: the symptoms of clinical hyperparathyroidism are similar to those produced by the experimental injection of excessive amounts of parathormone. They include:

1. Hypotonia.
2. Diminished electrical excitability of muscles.
3. Decalcification of bones.
4. Hypercalcemia.
5. Abnormal excretion of calcium in the urine.
6. Nephrolithiasis.
7. Hypophosphatemia.

Hypercalcemia is the most significant clinical sign. Determinations of calcium and phosphate content of the blood serum should be made in all cases of generalized bone disease, not only as a matter of interest, but because of their therapeutic indications.

T. A. Peppard, M.D.

ROENTGENOLOGY

SUPERVISORS

LEO G. RIGLER

UNIVERSITY HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS

MAYO CLINIC, ROCHESTER

ROENTGEN STUDIES ON THE APPEARANCE OF SPINAL TUBERCULOSIS IN AN EARLY STAGE: M. Sgalitzer (Fort. a. d. Geb. d. Rönt., V. 40, p. 761., Nov., 1929). Sgalitzer presents, in a well illustrated article, a series of cases to demonstrate the factors in the roentgen diagnosis of early tuberculous spondylitis. The most important of his findings are:

1. Paravertebral abscess is present in two-thirds of the cases, may be recognized much earlier in the roentgenogram than clinically, and, when present, is almost pathognomonic of spinal tuberculosis.

2. Paravertebral abscess may be the only roentgen evidence of this condition. This may indicate either a very early tuberculosis or a very benign type.

3. The size of the abscess bears no relationship to the extent of the tuberculosis.

4. A change in the normal curve of the spine, such as the presence of kyphosis of the cervical or lumbar vertebræ may be a very early sign of the disease.

5. We may occasionally see the tuberculous focus as a large or small area of destruction in the center of the vertebral body without any narrowing of the intervertebral disc.

6. Another type of case presents a slight narrowing of the anterior portions of a number of vertebral bodies with narrowing of the discs and possibly a large abscess.

7. Calcification may occur in the abscess and give distinct shadows.

8. Osteomyelitis may also give an abscess and presents the only difficulty in the roentgenologic differentiation. The history and other findings will usually rule it out.

9. There is a type of vertebral tuberculosis which is very benign and very chronic, and is often mistaken for "rheumatism." Many of these cases show large abscesses which serve to identify them even though no definite changes are visible in the vertebræ themselves.

Leo G. Rigler, M.D.

FACTORS OF ERROR IN THE ROENTGENOLOGIC DIAGNOSIS OF DISEASES OF THE COLON: H. M. Weber, M.D. (Radiology, XIV, 5, May, 1930, p. 460). The accuracy of roentgenologic examination of diseases of the colon is very high. Thorough cleansing of the bowel is necessary for accurate diagnosis and to avoid errors due to apparent filling defects caused by fecal material, gas, and retained pockets of fluid in the colon. Palpation is done under roentgenoscopic control while the barium enema is being given. To assure complete filling of the cecum the enema should be permitted to pass through the ileocecal valve into the terminal ileum.

The filling defect or organic deformity of the luminal contours is by far the most common roentgenologic sign of colonic disease. Carcinoma, diverticulitis, tuberculosis, localized chronic ulcerative colitis, localized encroachment on the lumen of the bowel by extrinsic processes, organic inflammatory stricture and syphilis, named in the order of their frequency, manifest themselves by filling defects, constantly or occasionally. The filling defect of carcinoma is annular, polypoid or obstructing. Diverticulitis is generally found in the sigmoid colon and produces a spindle-shaped shadow with serrated contours and usually the extra-luminal pockets can be demonstrated. Both the attending spastic factor and the mural inflammatory infiltration combine to form the filling defect. Localized chronic ulcerative colitis resembles carcinoma and the differentiation is often difficult. Deformities due to extrinsic lesions may be caused by direct pressure on the colon or by spasticity due to inflammations in the immediate neighborhood. Organic stricture and syphilis of the colon are rare. Tuberculosis is generally found in the cecum and ascending colon and produces an irregular filling defect and a peculiar boggy consistence of the bowel. It is almost always associated with pulmonary tuberculosis.

Several films illustrate the conditions described.

Jacob Sagel, M.D.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
MEDICAL ARTS BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

IDIOPATHIC ANEMIA OF THE NEW-BORN INFANT: Wm. Morris Happ, M.D., Los Angeles (Arch. of Ped., March, 1930, Vol. XLVII, No. 3). Pediatric literature contains very meager information concerning idiopathic anemia of the new-born infant. By this term is meant an anemia occurring during the first few days of life for which there is no satisfactory etiologic factor. Only six cases of anemia in new-born infants have been reported.

The infant is born at term, the birth is normal. Pallor may be noted at birth or during the first few days of life with gradual increase. This pallor is the only striking symptom and leads to an examination of the blood. This shows an actively regenerating anemia with marked reduction in red cells and hemoglobin. The white cells are usually increased in number, the differential count is normal; myelocytes may be present and platelets are normal. Active regeneration is evidenced by nucleated red cells, polychromatophilia and increase in reticulated cells. The spleen is usually slightly enlarged, but there is no general glandular enlargement.

In one case, where the fragility of the red cells was tested, this was found increased. The cases which have not been treated have recovered during the first year. Those treated by blood transfusion have recovered more quickly.

The etiology is obscure. There is no conclusive evidence of a hemolytic nature of these anemias. They regenerate rapidly. Blood transfusion seems to offer a definite stimulus to hematopoietic activity. It is recommended as the treatment of choice, together with the administration of iron, in the form of inorganic iron, in broths and liver.

R. N. Andrews, M.D.

THE USE OF GELATIN AS A SUPPLEMENTARY FOOD IN THE INFANT'S DIETARY: Theo. O. Elterich, M.D., D. H. Boyd, M.D., and Andrew Neff, Ph.D., Pittsburgh (Arch. of Ped., May, 1930, Vol. XLVII, No. 5). Ruehrar and Friedenwald state that only recently has the real value of gelatin in the diet been more widely known. It is very useful in rendering milk mixtures more digestible, preventing both gastric and intestinal indigestion by preventing the large, hard curds. It is of value in infants who regurgitate or vomit their food, in diarrhea, particularly where there is putrefaction. It is useful where gas is formed, either in the stomach or the intestines, and in fermentative conditions in general. It is useful in preventing colic in some babies, and in the breast-fed may be given in solution just before feeding. In infants who are constipated and who have large, hard stools which do not adhere to the napkin, the addition of gelatin to the formula usually corrects the difficulty. It is of great value in celiac disease, not only in supplying additional much-needed food, but in correcting the accompanying indigestion. In malnutrition the addition of gelatin to the dietary is of great value, as it is in those who have lost weight through operations, fevers, or other illnesses.

Large amounts of gelatin may be administered to very small infants over fairly long periods of time without any apparent unfavorable consequences.

Contrary to previously reported studies, gelatin does not accelerate growth out of proportion to calories ingested. Gelatin acts like protein matter and gain in weight is in proportion to protein-carbohydrate ratio.

Our feeling would be that gelatin addition to formulæ produces results similar to those found when protein milk is added to formulæ, but it must be remembered that gelatin is an incomplete protein. On the other hand, the addition of gelatin to a formula of an older infant is less likely to be distasteful than would be the case with high acid formulæ.

One hundred calories of gelatin (four level tablespoonfuls of powdered gelatin) may be added to the day's formula without increasing the volume. This is an advantageous factor in cases where infants have a tendency to vomit, in cases where high cereal formulæ are necessary, or in cases where it is difficult to get infants to ingest normal quantities of food.

Gelatin may be a food factor in certain unusual allergic infants, where the ingestion of either breast or cow's milk cannot be tolerated.

R. N. Andrews, M.D.

CONSULTATION BUREAU

(Continued from Page 510)

start as a rule with so much pain. Was there any history of excessive exposure to the sun? Spontaneous subarachnoid hemorrhage should be considered. As a general rule spinal puncture reveals the nature of this disease. The fluid is either bloody or tinged a yellowish color. If you had done a Queckenstad test, that is, pressure on the jugulars with a spinal needle in position, you might have found a block which would explain the absence of bloody fluid. As a general rule this disease occurs in young people and has a fairly favorable prognosis. There is diffuse hemorrhage over the surface of the brain of probable unknown origin. Was there any history of trauma or drugs? Brain tumor should also be considered. In spite of the negative fundi, it would be advisable to do an estimation of the visual fields. It may be done without much difficulty, and in spite of the fact that the patient is now feeling better I would advise you to examine him again for any disturbance in his fields. This is especially valuable in tumors of the pituitary gland and may also be of diagnostic value in temporal and occipital tumors. As a last resort and after prolonged observation, a probable psychic origin for the headaches should be considered. It would be advisable for you to check the patient at frequent intervals with a thorough neurological examination and not to let him go because no definite diagnosis can be made.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

OBSTETRICS FOR NURSES. Charles B. Reed, M.D., F.A.C.S., Professor of Obstetrics, Northwestern University Medical School, Chief Obstetrician Wesley Memorial Hospital, Chicago, and Charlotte L. Gregory, R.N., B.S., M.D., Adjunct in Obstetrics Wesley Memorial Hospital, Clinical Assistant in Obstetrics Northwestern University Medical School, Chicago. 399 pages. Illus. Cloth $3.00. St. Louis: C. V. Mosby Company, 1930.

MINOR SURGERY. Arthur E. Hertzler, M.D., Chief Surgeon, Halstead Hospital, and Victor E. Chesky, M.D., Chief Resident Surgeon, Halstead Hospital, Halstead, Kansas. Second Edition. 602 pages. Illus. Cloth $10.00. St. Louis: C. V. Mosby Company, 1930.

PHYSIOLOGY AND BIOCHEMISTRY IN MODERN MEDICINE. J. J. R. Macleod, M.B., LL.D., D.Sc., F.R.S., Regius Professor of Physiology in the University of Aberdeen, Scotland; formerly Professor of Physiology in the University of Toronto, Canada, and in the Western Reserve University, Cleveland, Ohio. Sixth Edition. 1074 pages. Illus. Cloth $11.00. St. Louis: C. V. Mosby Company, 1930.

CERTIFIED MILK. Proceedings of the American Association of Medical Milk Commissions, Inc. 350 pages. Illus. Cloth. Brooklyn, N. Y.: American Association of Medical Milk Commissions, Inc.

ALIMENTARY ANAPHYLAXIS. Guy Laroche, Charles Richet Fils and Francois Saint-Girons, of Paris, France. Translated by Mildred P. Rowe and Albert H. Rowe. 139 pages. Cloth $2.00. Berkeley, Calif.: University of California Press.

CLINICAL FEATURES OF HEART DISEASE. Leroy Crummer, M.D., Emeritus Professor of Medicine, University of Nebraska. Introduction by Emanuel Libman, M.D., Professor of Clinical Medicine, Columbia University. Second Edition. 415 pages. Cloth $4.00. New York: Paul B. Hoeber, Inc.

ALLERGIC DISEASES—Their Diagnosis and Treatment. Ray M. Balyeat, M.A., M.D., F.A.C.P. Lecturer on Allergic Diseases in the University of Oklahoma Medical School; Consulting Physician to St. Anthony's Hospital and to State University Hospital, etc. 395 pages. Illus. Cloth, $5.00. Philadelphia: F. A. Davis Company, 1930.

MERCK'S INDEX. An encyclopedia for the chemist, pharmacist and physician. Fourth Edition. 585 pages. Rahway, N. J.: Merck & Co., Inc.

UTERINE TUMORS. Charles C. Norris, M.D., Professor of Gynecology and Obstetrics, University of Pennsylvania. Limp leather. Price, $3.00. 251 pages with 14 illustrations. New York: Harper & Brothers, 1930.

This small volume is one of a series of medical monographs published, and in preparation by Harpers.

The author stresses the importance of the uterus as a site for neoplasms whose course and share in the increasing cancer mortality may be definitely effected for the better by early diagnosis and careful treatment. The work is largely based upon material from the laboratory of the Hospital of the University of Pennsylvania, and this, coordinated with treatment and follow-up records, is the basis for the author's recommendations.

The Clark test for carcinoma of the fundus is stressed as a simple means for early diagnosis of that condition. "It is of great practical value, and although it lacks the accuracy obtained by curettage, it possesses the following advantages: it may be employed in the physician's office; it requires no special skill or histologic knowledge, or extensive armamentarium; it involves no loss of time." In this test a sound is inserted into the fundus; if a friable, vascular growth is encountered, withdrawal of the sound will be followed by a trickle of bright blood from the cervix.

There is a careful evaluation of results obtained by the use of surgery, radium, and x-ray treatments.

The book has seven chapters as follows: Cervical Polyps, Carcinoma and Other Malignant Tumors of the Cervix, Carcinoma of the Body of the Uterus, Myoma Uteri, Sarcoma and Allied Tumors of the Body of the Uterus, and Tumors of the Chorion.

E. C. HARTLEY, M.D.

INFANT NUTRITION. William McKim Marriott, B.S., M.D., Professor of Pediatrics, Washington University School of Medicine; Physician in Chief, St. Louis Children's Hospital, St. Louis. 375 pages. Illus. Cloth, $5.50. St. Louis: C. V. Mosby Company, 1930.

Very few outstanding pediatricians are able to resist the urge to write a book on advice to mothers, or a volume on infant feeding. Thus it was to be expected that W. McKim Marriott of St. Louis would produce a text of this type. His extensive training in physiochemistry has manifested itself in the very excellent chapter on anhydremia, acidosis and alkalosis. Otherwise it resembles closely the stereotyped book of its kind. It does, however, include many of the newer ideas in infant feeding, and omits repetition of obsolete theories and methods. The author's ambition to simplify the subject of infant feeding does not seem entirely realized, although in this respect he has achieved no less than his predecessors.

The writer demonstrates the tendency in pediatrics toward ample feeding, as opposed to the underfeeding so commonly practiced in the past. Thus, he advocates giving infants both breasts every four hours, instead of one breast at a feeding, as is so commonly advised; also, that infants require 2.5 to 3 ounces of breast milk per pound of body weight daily—a more generous allotment than formerly. He states similarly

that the caloric requirement of a normal infant is 115 calories per kilo. He stresses the necessity for feeding an undernourished infant on a basis of what it should weigh rather than on its actual weight. His suggestion that pasteurized milk is usually as satisfactory as certified milk, but that all milk for infant feeding should be boiled regardless, is in harmony with present day thought. Marriott's preference for codliver oil over viosterol in the prevention and treatment of rickets is soundly founded. Caution against the use of cathartics in treatment of diarrhea is justly emphasized.

The author's belief that hidden otitis media and symptomless mastoiditis are commonly responsible for alimentary intoxication, and the advocacy of mastoidectomy in such cases, is still a subject for loud controversy among pediatricians, as well as otologists. One hesitates in accepting such radical advice.

The author's original suggestion of using insulin in anorexia of infancy and childhood is not mentioned in this volume; in fact the entire subject of anorexia is disregarded. The medical student and general practitioner, for whom this book was intended, will find it lacking in explicit information regarding the feeding of normal infants with milk mixtures, as well as in detailed advice concerning the administration of solid foods during the first year of life. In these respects it resembles many similar texts on infant feeding. The man who does not possess such a book will, however, find this volume generally very satisfactory.

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MINNESOTA MEDICINE

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THREE CASES OF BRAIN SURGERY*

ARNOLD SCHWYZER, M.D.
Saint Paul

IF A GENERAL surgeon operates nowadays on a brain tumor there ought to be some particular reason for his doing so, because this work has become a specialty and, in our country, there are a number of the foremost masters in this field. In the last two years we have operated upon five such cases of brain lesion. In one the tumor gave no clue as to its localization. The bedridden patient was in a most pitiable condition and a subtentorial decompression was done to relieve the pain and to save the little vestige of eye sight remaining. The headaches were relieved, but the patient died soon. In a second patient already in a stuporous condition, the roentgenologist and the ophthalmologist had both made a definite diagnosis of tumor of the hypophysis. The posterior clinoid processes of the sella turcica were absent. The whole sella was greatly flattened and drawn out backward as seen in suprasellar tumors; but there was no tumor. At postmortem an infiltrating tumor of the left frontal brain was found.

The other three patients I can show you here tonight. The first two of these patients had refused to go to more specialistic surgeons after our limited experience had been freely stated, nor was there much time to lose. The third patient seemed to be less of a difficult surgical problem than the other two.

The first case, a woman thirty-three years old, was kindly referred to me on November 3, 1927, by Drs. Binger and Kamman. The salient points of the history are as follows: She had always been well up to the present illness. Three years ago she noticed a beginning deafness of the left ear, steadily increasing. Seventeen months ago, about a month before her youngest child was born, the vision became poor and she began to see double. At the same time weakness in the legs started, especially in the left. There was no pain in the legs. As time progressed she became worse, finding that she could not think as well as formerly. She would easily forget things. She had never vomited except a few times in August 1927 when she had influenza. Only once was the vomiting projectile. The patient had never had headaches or pain in the neck. There had been no preceding injury.

Upon examination, the chest and abdominal organs were normal. X-ray plates of the head showed nothing abnormal. The sella turcica in particular was normal in appearance.

Neurological Examination (mostly from notes by Drs. Kamman and Binger):

Cranial nerves:

I—Olfactory, normal.

II—Eye sight reduced to counting of fingers. Bilateral papilloedema, more marked on left, where the swelling of the nerve head amounts to four diopters; on the right side two to three diopters. Small retinal hemorrhage below in left eye.

III, IV, VI—Bilateral nystagmus, fine on looking toward right, coarse towards left. On right conjugate deviation the left eye turns somewhat down. Proptosis in left eye, 2. Lid space on left side 3 mm. larger than on right.

V—Left corneal reflex absent. Delayed contraction of left masseter and temporal muscles. Deviation of jaw toward left (Pterygoids).

VII—Weakness of central type in left facial.

VIII—Left nerve, complete deafness. Weber lateralized toward right. Hearing on the right side normal. Dr. Binger had made equilibratory tests which showed destruction of the left vestibular nerve and lack of response from the vertical semicircular canal of the right ear. All other cranial nerves normal. (No dysphagia.)

Motor system:

Arms—Left arm shows hypotonia, adiadokokinesis and intention tremor. No ataxia. Muscle strength normal. Right arm normal throughout.

Trunk—No deviation of umbilicus.

Legs—Some hypotonia and slight ataxia of left leg. Muscle strength normal on both sides.

Gait—Patient walks slowly and with a wide base.

Station—Slight Romberg, but not lateralized to either side.

Sensation—Normal throughout for touch, pain, heat and cold. Passive motion, position and vibration sense,

*Read before the Ramsey County Medical Society December 30, 1929.

stereognosis, topognosis and two-point discrimination preserved in all areas of the body.

Reflexes—On left arm slightly diminished. Left knee jerk pendular. No Babinsky or ankle clonus.

Mental—Negative. Slight slurring and stumbling over test words.



Fig. 1. Case 1. Sketch made by the operator directly after the operation to show the extent of the bone flap, the opening of the large mastoid cells, the dural flap to cover them, the exposure of the lateral sinuses and torcular Herophili, the puncture of the left lateral ventricle, the division of the falx cerebelli and the broken off posterior rim of the foramen magnum.



Fig. 2. Case 1. Tumor as it presented itself. We did not succeed in giving the proper impression of the depth of the tumor, which reached the midline in front of the pons. The mobilization of the cerebellum may be noticed and the covering of the mastoid cells by the dural flap.

Diagnostic impression (Dr. Kamman): History of progressive deafness of three years, together with choked discs, without headache but positive cerebellar signs and absence of left corneal reflex are strongly suggestive of a tumor in the left cerebello-pontile angle, probably neurofibroma of left eighth nerve.

To this may be added the data furnished by Dr. Binger, who found a complete destruction of the left cochlear and vestibular nerves and also of the fibres from the right vertical semicircular canals. They are the first ones to be damaged by pressure from the other side as they run more medially in the medulla. I. H. Jones of Philadelphia found this to be a regular and characteristic symptom in tumors of the acoustic nerve.

Most of this examination was made on October 28, 1927. The patient was then rapidly getting worse. She seemed forgetful and the stream of thought became delayed. On November sixth, I dictated: Patient is less responsive than two days ago. When asked to get up she stares and after my questioning says, after some delay, that she is thinking. When questioned what she is thinking, she answers "seriously." She declares on inquiry that it is hard for her to think. In these few days a distinct degree of stupor had developed.

Operation November 7, 1927. The operation was done entirely under local anesthesia, which was apparently perfect even during the intra-cranial maneuvers. The incision was made, with a moderate convexity upward, from behind one mastoid process to a corresponding point on the other side. From the ends of this cut the incision was carried straight down on the neck for a sufficient distance on each side. The bone was divided in a similar line as the skin incision as we had decided to retain the bone. The line of division reached a little above the occipital protuberance and ran horizontally above both lateral sinuses till near their downward bend. Bleeding from emissary veins was controlled by bone wax and compression. From the two lateral drill holes we divided the bone downward toward the foramen magnum with Dahlgren's forceps. Apparently through pressure the bone had become thin and brittle in the lower area. A Doyen chisel with a protecting projection on the under side of the bit was then inserted on each side at the lower end of the lateral bone incisions and with a stroke or two the bone was split for some distance toward the midline. It is well known that in these cases of markedly increased intracranial pressure the cerebellum is commonly wedged into the foramen magnum and that the slightest additional pressure on the medulla oblongata will cause apnea and perhaps prompt disaster. We therefore carefully pried the bone loose by using leverage low down in order to avoid an inward tilting of the lower rim of the bone flap. The bone did not break where we had used the chisels, but the posterior rim of the foramen magnum broke off in one piece with the occipital flap. In two other cases of ours with similar procedure the break occured at the desired level, but in this patient we had gone farther down and the intracranial pressure had greatly thinned out the bone, leaving intact only the strong median vertical ridge. A shearing off of the medulla was averted by the prying and steadying action of two elevators near the base of the flap, while this latter was gently and slowly raised. That no untoward symptoms followed was perhaps due to two reasons: first, that the lateral incisions of the soft parts were liberal and that therefore the occipital bone did not swivel on firm muscular masses; and sec-

ond, that as soon as the flap was somewhat raised we forcibly pulled on it straight backward with only gradual tilting, relying at the same time on the two elevators with their gentle but energetic lifting action.

The circular part of the occipital sinus (marginal sinus) which runs along the edge of the foramen magnum, was not injured. The two lateral sinuses were now freely visible in their course and all of the torcular. Enough bone had been removed so that we could tap the left lateral ventricle above the lateral sinus, in the hope of reducing the great tension. However, only a few drops of clear fluid escaped. In order to get sufficient access, the bone had to be removed to the edge of the sigmoid sinus on the left side. The *x*-ray picture had shown that the mastoid cells reached unusually far back. They had to be opened widely. Two of the cells were quite large, one of them eight millimeters long by a width of four or five. Here, Lane's forceps were most useful. The dura was then opened and the occipital sinus with the falx cerebelli divided between clamps and tied off with fine catgut. This allowed better displacement of the cerebellum. The dural incision ran about one centimeter below the lateral sinus, but on the left side a large triangular flap with a lateral base was formed in order to cover the mastoid cells. The base of this flap was at the very edge of the sigmoid sinus.

Gently lifting the left half of the cerebellum with a spatula and following the posterior aspect of the petrous bone along its lower border we reached the tumor in the depth. It was markedly deeper than I was able to indicate in the sketch. It looked bluish and cystic on account of the distended arachnoid, which covered it. Some fluid escaped when this covering was opened. The tumor itself was irregularly nodular and rather friable. No distinct capsule could be made out. The part which could be seen was, however, sharply outlined. We then gradually removed in pieces what seemed to be the bulk of it. The weight of the removed portion was nine grams. Feeling with the finger we were sure that there was some remnant left. However, we had reached forward in the midline to the clinoid area, which had not shown any signs of absorption in the roentgenogram. Toward the brain stem we could not make out a clean outline, but further advance would have greatly endangered the most vital structures. With Cushing's experience in attempts at complete removal in our mind, as related in his classic book on "Tumors of the Nervus Acusticus," it was decided to do no more, though W. E. Dandy in his publication in 1925 in "Surgery, Gynecology and Obstetrics" had demonstrated that a complete removal of these tumors may be possible. A good number of years of relief with an undamaged facial nerve was on one side of the scales, and on the other was possible complete removal of the tumor but certain sacrifice of the facial nerve with marked danger of keratitis and with great risk of prompt death. This risk appeared prohibitive because of the inability to find a line of cleavage toward the pons. On the other hand the thought of an energetic postoperative radium treatment gave us some comfort in our decision.

The dura was sutured back into place by the finest silk sutures. The bone flap was turned up under forcible pulling backward to avoid any damage at the foramen magnum. Strong forty day chromic catgut was used for muscles and fascia, which did not, however, prevent a gradually developing backward tilting of the flap. We did not remove the bone, as is usually done,



Fig. 3. Case 1. Fragments of the tumor as they were removed (natural size).

because with a wide opening to above the torcular with free exposure of both lateral sinuses the replacing of the protective shell seemed very desirable. On the other hand a more limited exposure, we felt, would have rendered the intracranial manipulations more dangerous and less gentle—at least in our hands.

At the end of the operation the patient was in good condition. Though no general anesthetic was given at any time and only 0.5 per cent novocain had been used for the soft extracranial parts (assisted by 1/6 grain of morphine and 1/150 of atropin, given before the operation), the patient moaned only once. This was when the bone flap was turned down. At no time was there interference with the respiration. During the work on the tumor the patient was motionless and breathing quietly, though conscious.

Of the postoperative course a few notes may be of interest. One hour after returning from the operating room the patient was asked by one of the doctors: "Who is speaking?" and the answer was correct. The face was not paralyzed. At 7 p. m. (six hours after the operation) she talked quite rationally and surprisingly much; in fact, this was in striking contrast to her behavior on the last day before the operation when a stupor had become apparent and she had not talked except when asked questions, and even then only slowly with a much blurred conscionsness. Now she wanted to know what was going to happen and on being ques-

tioned said she had pain, at times even a great deal, during the operation, but said "I did my best. I wanted to see this thing through." Her vision seems not damaged, she counts fingers correctly. She swallows freely without coughing afterward. She can close the eyes and whistle. Her pulse is one hundred and twenty-six.

distal end of a heavy lead tube to avoid lateral rays. The filtering consisted of one millimeter of brass (the radium containing capsule), one millimeter of lead and one and a half centimeters of wood. Fields all around the head allowed us to give 7050 milligram-hours of hard rays at one session without damage to the hair



Fig. 4. Case 1. Low power; showing palisade spindle cell strands and reticular areas; also cysts.

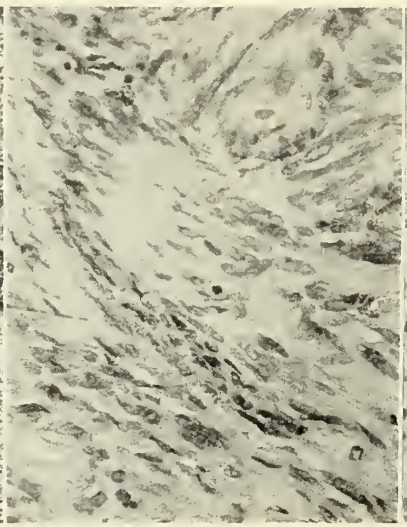


Fig. 5. Case 1. High power. Strands of spindle cells.

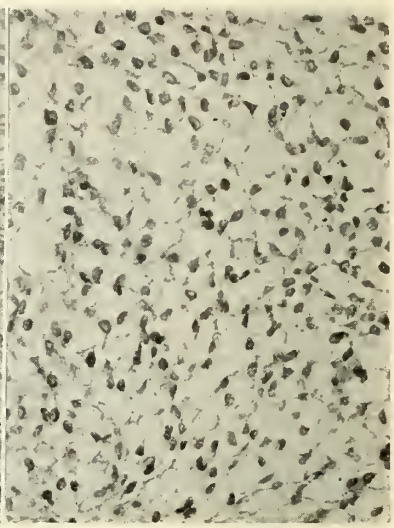


Fig. 6. Case 1. High power. Reticular area.

On the day after the operation she said she could not complain. In the evening she appeared very normal in her behavior, smiled and did not talk too much. She has a little pain where she was operated upon. Asked to multiple five times seventeen she very promptly answered: "Eighty-five." Nevertheless after a while she appeared tired out and was not sure that she had been operated upon. "Something has happened; something was done to the back of the head, but I do not know if that was the operation."

On the next day (forty-eight hours after the operation) she declared she felt better. The trigeminus, which is most frequently affected in these tumors of the acoustic nerve, due to its proximity, and whose motor root had been found paretic in our case before operation, proved not to be any further damaged, as the sharp and blunt end of a lead pencil was differentiated exactly all over the face.

On the fifth postoperative day oozing of cerebrospinal fluid required dressing. On the following day the corneal reflex, which had been absent before the operation, was found to have returned, though it was still weak and retarded. On November 14, one week after the operation, the nystagmus was much improved. Cushing considers the nystagmus in acusticus tumors to be due to cerebellar rather than vestibular disturbance. The more the cerebellum was manipulated at operation the more the nystagmus was noticed to be increased. On December 5, the patient was discharged.

A month later she returned for radium treatment. From a distance of six centimeters from the skin 75 milligrams of radium were applied. It was put at the follicles. When she came for this treatment her mental condition was not as good as it had been. This dated back to a ride over a rough road four days previously.

Dr. Kamman made a neurological examination on January 7, 1928, with the following report: "Marked subsidence of all pathologic reflexes. The corneal reflexes are now equal. The proptosis has receded and the facial palsy is clearing up. The extra-ocular palsies are about the same as at the preoperative examination. The palate rises in the midline and there is no pharyngeal anesthesia. The patient's mental condition is much clearer than on previous examination. She is well oriented in all spheres, responds fairly promptly and accurately, and expresses no hallucinations or delusions. There is some small amount of mental confusion, but not nearly reaching its former degree of intensity."

When seen again in May, 1928, a considerable further improvement was noticed. She could talk freely, the voice was stronger. She looked well, could walk alone, had gained twenty-five pounds, and had no trace of headache. Her husband stated that she was reading a great deal, books and newspapers.

On September 30, 1929, she came again for examination. Since the operation she had gained from 85 pounds to 135 pounds. She read small print very fluently. She was feeling "fairly well." There was a sensation of pressure in the head, though she had no headache. The left eye was still turned down a trifle which caused double vision in some positions.

Radium treatment will be continued for a long time at intervals, in the hope of delaying signs of recurrence.

Time does not permit us to go into a more general discussion of this subject. Prompt action was needed in our case when a distinct stupor made its appearance, and when the greatly damaged eye sight and the choked discs with a retinal hemorrhage warned us of the rapidly approaching irreparable blindness. In subtentorial tumors the papilloedema with great distension of the retinal vessels is a very regular and early danger signal. It occurs earlier and reaches a higher degree than in most other brain tumors. Nevertheless, as I might mention in parenthesis, I found it once completely absent in a cerebellar tumor of large size. This patient had free flowing of cerebro-spinal fluid from the right nostril, so-called cerebro-spinal rhinorrhea, which of course relieved the tension.*

As to the microscopic study of the case, let me say that without the help of Cushing's book the diagnosis would have been uncertain. However, Cushing has cleared up the character of these acusticus tumors and has shown that they belong in one group, are not infiltrating and are well encapsulated. They originate from the supporting structure of the nerve, which in the portion near the cerebellum is glia, while after a course of from seven to ten millimeters away from the cerebellum a transition into connective tissue endoneurium occurs. The tumor arises apparently from the incompletely differentiated supporting structure of the acusticus, and glia-like reticular areas alternate with cellular strands of long connective tissue cells which are arranged in interlacing bands and whorls. The staining qualities being somewhat different from adult tissue, whether glia or fibrous, leads Cushing to the opinion that the tumor arises from embryonal remnants. Ganglion cells may be normally found in the nerve (the cochlear and the vestibular roots have each a ganglion at their distal end) and ganglion cells are at times found in varying numbers in the acoustic tumors. These growths are always surrounded by the pia-arachnoid, because the arachnoid enters for several millimeters into the internal auditory canal, enclosing the nerve. In our sections, the picture corresponded pretty well with Cushing's description. The bulk was composed of long cells in palisade arrangement, forming interlacing strands and whorls. These alternated with areas of neuroglia-like reticular structure with fewer nuclei of a round shape and a fibrillar network between the cells. At the periphery of the tumor there were numerous cystic spaces, many of them quite large. The walls and interspaces between the cysts are of orderly design and have again palisade arrangement of densely arranged cells. They are, therefore, part of the tumor. The blood vessels showed marked hyalin degeneration, which Cushing declares to be one of the characteristics of these neuro-fibromata of the nervus acusticus.

*The case was published in the St. Paul Medical Journal in 1902.

The history of the second case is the following:

Mrs. J. G., forty-eight years old, was referred to me on May 1, 1928, by Dr. Binger because of a suprasellar tumor. Two years previously, in May 1926, the patient had had a fainting spell. She lost consciousness and had foam showing from the mouth. This occurred at night and the following morning she could not see out of the left eye. In fact, she had been able to see hardly anything with either eye for two weeks, after which the right eye improved gradually. A numbness in the left hand had been felt and she had headaches and pressure in the left frontal area, which necessitated morphin. The vision remained blurred; she could not recognize, for instance, the features of her nurse. After rest in bed for five weeks the visual acuity had improved to the point that she could recognize flowers in the room and their colors. The condition was considered by her physician to have been a stroke of apoplexy. On the second of November 1926, Dr. Binger of St. Paul was consulted on account of the very poor vision.

The left eye was amaurotic with the exception of a very limited area of perception temporally and upward near the periphery of the field of vision. The right eye had a concentric narrowing of the field of vision with a vision of six-tenths. Colors were seen centrally only.

On February 9, 1927, the field of vision had changed in a manner which became significant and led to an *x*-ray study of the case. In the left eye there was no change; there was only the mentioned small area of perception laterally, no perception in the nasal field. In the right eye, however, the vision in the temporal field was greatly reduced as compared with the findings three months before.

Roentgen pictures then demonstrated a tumor above the sella turcica. The location of the tumor made it of doubtful operability and *x*-ray treatment was tried. Four series of ten to twelve treatments each were given between May and December 1927. The headaches were considerably relieved, but the ocular findings remained very much the same. In May 1928, when I first saw the patient, she stated that for the last five weeks there had been almost a constant pain in the right side of her face shooting into the left eye, the worst pain being located in the right upper jaw area.

There were no urinary symptoms, no motor difficulties. For a while she had complained of a noise in her head, but this had disappeared somewhat.

Previous history: Eighteen years ago appendectomy and tonsillectomy.

Family history: One brother living and well; one sister living and well; one sister died from an accident.

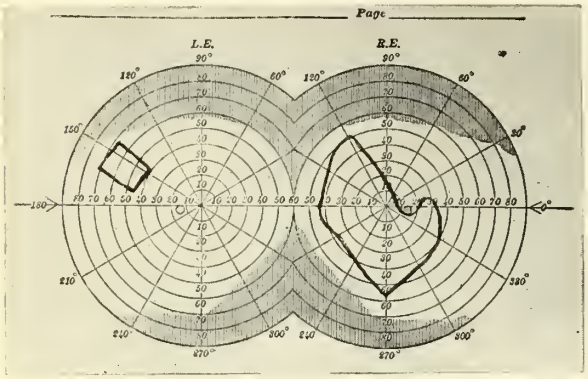


Fig. 7. Case 2. Field of vision. Moderate reduction in nasal field of right eye. Marked reduction in lateral field of right eye. Only small peripheral remnant in lateral field of left eye and complete amaurosis in left nasal field. Therefore, complete damage to left lateral nerve bundles, almost complete damage to left inner (nasal) bundles, marked damage to right inner bundles and least involvement of the lateral portions of the optic fibers of the right eye.

Marital history: Husband living and well; no pregnancies.

Physical examination: Well developed and nourished. Besides some enlargement of the heart to the left all the findings were normal apart from the eyes.

The left eye sees a hand only when it is moved, and only in the temporal field, but does not recognize it as such. The right eye is better, but the large one-inch headlines of a newspaper cannot be read: she counts fingers at two feet. The optic papillæ in both eyes are white, showing very marked optic atrophy.

X-ray of the right upper jaw, where she had most pain, showed some sclerotic thickening, but nothing further.

X-ray of the skull demonstrated a round tumor with considerable calcification above the anterior part of the sella turcica. It measured about two centimeters in height and nearly the same in width. On stereoscopic examination it was seen to be located somewhat to the left of the midline, directly above the left anterior clinoid process. A faint semicircular shadow was seen by the roentgenologist, Dr. Schons, in the antero-posterior films, about one to two centimeters peripheral to the shadow of the calcified mass, which was considered by him as suggestive of a more recent extension of the growth (as compared with previous pictures). There was no evidence of any erosion at the base of the tumor.

The olfactory sense was not affected; roses and carnations were promptly recognized through either nostril.

Gustatory sense was good; salt and vinegar were promptly recognized.

Weight, 142.5 pounds. Hemoglobin, 76 per cent. Blood pressure, 120–98. Wassermann negative.

The unusual feature, which we came to analyze properly, however, only after the operative findings, was that we did not have a bitemporal hemianopsia as we see it in pituitary tumors where the patient sees as though he is wearing blinkers; furthermore, that the left eye was much more affected than the right one

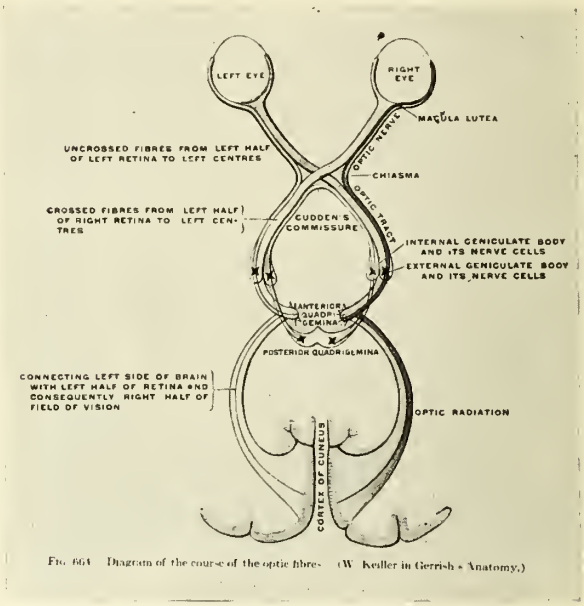


Fig. 8. Arrangement of optic nerve fibres (from Gray's Anatomy).

and that the left nasal field was completely amaurotic while a trace of vision remained in the temporal field. This would indicate that the left optic nerve was compressed from the outer side and not from the median side as occurs in pituitary tumors. The right optic nerve acted as though it was injured from the inner, *i.e.,* left side. In the lateral field the hand approaching from far laterally was seen only when it nearly reached the midline. What vision was left was mainly in the nasal field of the right eye; in other words, in the outer portion of the right optic nerve. The very marked damage to the inner optic fibres (corresponding to the lateral field of vision) of the right eye makes one think that not only the left optic nerve and chiasma, but even the left optic *tract* were affected, where besides the temporal optic fibres coming from the left eye we find the inner fibres from the right eye. By a pressure from the outer side acting on the left optic nerve at the chiasma all this would be explained.

An exploration was decided upon, and was done on May 9, 1928, entirely under local anesthesia. A large craniotomy was done on the *right* side, though the tumor was above the *left* anterior clinoid process, in order to keep away as far as possible from the center of speech. Three centimeters behind the outer angle of the orbit was the start of a somewhat mushroom shaped incision which followed the hair line to near the midline. Then about two centimeters from the midline we ran far back and turned around the parietal protuberance downward to a point about three or four centimeters back of the root of the helix of the ear.

Before doing this, the pedicle of this flap, directly over the ear, was tied off in three portions with deep reaching catgut sutures. Drill holes were then made. Between two posterior holes and again between two anterior ones we cut through with a Gigli saw to insure exact opposition on closing, while the rest of the bone



Fig. 9. Case 2. Skiagram showing calcified suprasellar area.

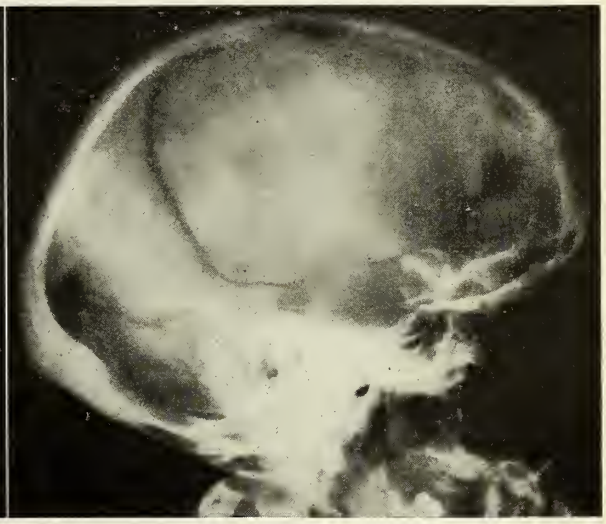


Fig. 10. Case 2. Skiagram showing extent of craniotomy.

incision was made with Dahlgren's bone shears. The pedicle was about six or seven centimeters wide. The widest diameter of the bone flap anteroposteriorly was twelve centimeters. We had difficulty inasmuch as the bit of the Dahlgren forceps broke, but as we were using de Quervain's modification of the forceps, which consists of a guard for this bit, it saved us from disaster. The head end of the table was then raised to about 40 degrees. The dura was cut about one centimeter from the bone surface with the pedicle posteriorly. Covering the brain with pads of moist cotton we gradually insert rubber strips over the frontal brain so as to protect it. The brain gradually had to be brought backward and outward. The orbital roof was laid bare, and gradually we created room. Then we came toward the clinoid process. This was a very slow process as we wanted the brain to change its form very gradually to avoid even fine lacerations. Now we could palpate in the midline or rather somewhat to the left a hard mass which was strongly pulsating. In size it corresponded to the tumor seen in the *x*-ray plate; it seemed even somewhat larger. Felt from the left lateral side, the pulsation was again directly under the finger and it was now clear that we were dealing with an aneurism of the internal carotid artery at the point of its division into several branches at the level of the circle of Willis. The dura was sewed back into place with fine linens and the bone flap replaced. A few linens in front and behind re-united the galea aponeurotica and the temporal muscle. The skin was closed by interrupted linens, closely and exactly applied. The catgut sutures (Heidenhain) at the base of the flap were left untouched. The patient was in good shape all through the operation, even during the time the frontal lobe was displaced. She was perfectly conscious. She only complained at the beginning of the skin infiltration and towards the end when we sutured the skin, because the operation had taken so long that the novocain anesthesia had worn off. At the end of the operation the patient appeared really in excellent general condition. Once during the operation when the brain was displaced she tried to vomit, but this lasted only a moment. Right after the operation she counted fingers with the right eye at three and a half feet while formerly only at two feet. This was undoubtedly due to the better light in the operating room. Her speech and sensorium seemed to be perfect. One hour after the operation the patient was reexamined; she differentiated between the smell of a rose and that of sweet peas in a very positive way. During the first twenty-four hours after the operation our patient vomited four times. She had vomited readily all her life. The menses, for instance, were always or almost always accompanied by vomiting.

We knew now what the pathology was and immediately had decided to ligate the left common carotid as soon as it could be done. The temperature remained normal, reaching only once 100° after some stitches were removed one week after the operation. On May 19th, ten days after the operation, the accompanying photograph was taken.

On May 21st, twelve days after the craniotomy, we ligated the left common carotid artery, again under local anesthesia through an incision parallel to the natural skin folds of the neck. The carotid was ligated with a forty-day chromic catgut and a few millimeters above this a silk ligature was put in to make the obstruction more permanent.

Practically immediately after the ligature of the carotid artery the patient felt better, though already since the craniotomy the pressure in the head had lessened. While she had had daily headaches for two years which had required constant use of bromides and luminal, the pressure in the head was so much better after the liga-

tion of the carotid that no such medication was any longer needed. Her head was clearer. The pain in the eyes and in the right side of the face and the right maxilla had already practically disappeared after the craniotomy and before the ligation was made.

After the ligation she vomited once, a few hours after the operation, perhaps from the novocain. In the night after the ligation she slept "fairly well." The next day she was allowed to go to the bathroom. Our patient appeared normal and clear and well oriented. Seven times eighteen, which she had not been able to figure out four days previously, was now promptly worked out as equaling 126—as promptly as only a healthy and somewhat trained person could figure. On being asked, how much was 13 times 14, she answered again surprisingly soon, 182. When we uttered our surprise at the rapidity of the answer she said she had been doing much of this kind of arithmetic in her daily work as a cashier.



Fig. 11. Case 2. Ten days after craniotomy.

An interesting surprise awaited us at this junction when we discovered, as soon as we took her away from this abstract arithmetic and asked her a most simple question of subtraction in applied arithmetic, that she was unable to answer correctly. She was unable to figure out what year she came to this country, though she knew that the year was 1928 and that she had been for twenty-seven years in the United States. She answered 1921, then 1919, then 1909 and then had to give it up. This may have been due, at least partly, to a rapid tiring.

On June 2nd the eyes were tested; and yielded about the same findings as on pre-operative examination. But on the nasal side of her right eye the patient, saw (as she thought) much better: she counted fingers at six feet. The outer optic fibres seemed therefore to have improved somewhat even in this short time. The eyes tired very rapidly and the patient declared she had seen "wonderfully well" early that morning. On that day, June 2nd, twelve days after her second operation, she was able to leave the hospital "feeling fine" as the nurse recorded.

On June 20th when the patient was brought to our office the bony apposition was perfect; no ridge could be made out.

On October 9th the patient came to our office with her sister. The record reads that she counted fingers at six feet. The patient was doing all her house work and tending to the furnace alone. It is noteworthy that the eyes had improved somewhat in the first twelve days after the ligation, but had almost remained at that level. This is, of course, what one expects in case of optic atrophy. She can read the headlines on newspapers.

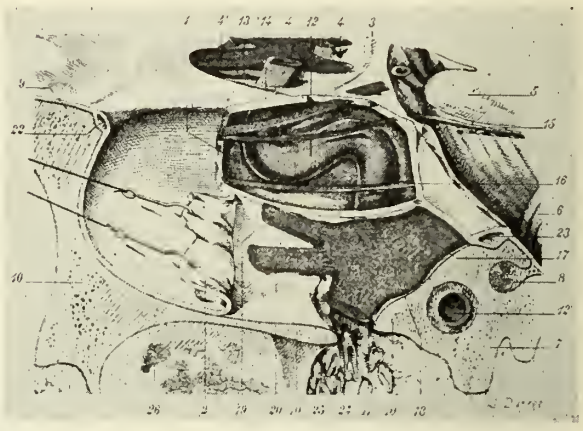


Fig. 244

Le sinus caverneux gauche, vue latéralement

(La paroi externe a été enlevée pour montrer le contenu du sinus)

1, sinus caverneux. — 2, dure-mère réfléchie en avant. — 3, diaphragme de l'hypophyse. — 4, chiasma optique, avec 4', bandelette optique, 4'', nerf optique. — 5, pédoncules cérébraux. — 6, cervelet. — 7, rocher. — 8, conduit auditif interne avec les trois nerfs qui le traversent. — 9, petite aile du sphénoïde. — 10, grande aile du sphénoïde. — 11, trou ovale. — 12, 12', carotide interne. — 13, artère ophthalmique. — 14, nerf moteur oculaire commun. — 15, pathétique. — 16, moteur oculaire externe. — 17, trijumeau. — 18, ganglion de Gasser. — 19, ophthalmique. — 20, maxillaire supérieur. — 21, maxillaire inférieur. — 22, sinus de Breschet. — 23, sinus pétreux supérieur. — 24, veine du trou ovale, traversant ce trou pour se rendre à 25, plexus veineux ptérygoïdien. — 26, muscle ptérygoïdien externe.

Fig. 12. Internal carotid seen in its passage through the cavernous sinus and emerging upward into the cranial cavity to the side of the optic chiasm (from Testut, Anatomie Humaine).

I have seen two other patients with aneurysm of the internal carotid artery. These were cases of exophthalmus pulsans due to formation of an aneurysm of the internal carotid into the cavernous sinus. The eye was protruding severely, pulsated, was engorged, and a loud swishing pulsatory noise could be heard when the stethoscope was put to the skull. In this latter location, aneurysms are not so very rare, but of the location above the cavernous sinus, where the artery divides into its several branches, I had never seen an instance. Nevertheless, even here aneurysms have been observed.

Sitting next to my countryman and friend from student days, Dr. Adolph Meyer, Professor of Psychiatry at Johns Hopkins University, at a banquet given in his honor about six weeks after this operation, I started to speak of the case,

mentioning the *x*-ray findings, laying stress on the extramedian position over the clinoid. Dr. Meyer quietly asked, "Could it have been an aneurysm?" When I asked him in surprise how he happened to think first shot of the right thing, he answered smilingly, "Well, I have seen two such cases."

The roentgenologist had been misled by a shadow which made him suspect an extension of the "growth" since the previous examination.



Fig. 13. Case 3. Calcified tumor in parieto-temporal area.



Fig. 14. Case 3. Calcified tumor in left parieto-temporal area.

The third case was kindly referred to me by Dr. Rizer of Minneapolis. The patient, a girl of fifteen years, was first seen by me on September 17, 1929. She came with Dr. Rizer's diagnosis of a tumor in the left temporal area. *X*-ray films showed the tumor beautifully. The history was as follows: In May 1927 she began to have convulsive attacks. Even the first attack was severe with convulsions and unconsciousness. Since then many of the attacks had been milder. They appeared practically every day since May 1927, changing in severity. The attacks have always been preceded by a peculiar sensation in her tongue, which warns her to lie down. She has never bitten her tongue. Occasionally she foams at the mouth. She is never incontinent. The patient had been under the care of many doctors. Medication and diet relieved her somewhat. For the last two months she had had no medication and since then the attacks had come on at least once a day, often two and quite frequently three times daily, never more than four. The right side was always involved in the convulsions.

The general examination revealed nothing further. The patient was well developed and nourished. The pupils, eye movements and the fundi of both eyes were normal. Reflexes and position sense were normal. The blood pressure was 124—80, the pulse 70.

On close inquiry into the character of the attacks the members of the family stated that the left side of the body was never involved in the convulsions. In the mild attacks the right leg and arm were stretched out rigidly. When the attack was severe there also occurred much jerking. The light attacks were over in a few seconds, while the severer ones were declared to last four or five minutes (?). During the lighter spells the patient heard what was going on, but not in the severer attacks.

The *x*-ray plates showed a central area of mottled appearance, apparently calcified, about the size of a silver dollar, though not circular but rather boggy in outline. Around this dense area one could recognize a less distinct zone of from a half to one and a half centimeters in thickness. The mass was located slightly below the middle between the base and dome of the skull and its center a trifle in front of a vertical line drawn through the meatus of the ear. On the plates made antero-posteriorly it reached from the bone, which is intact, to a depth of five and a quarter centimeters, reaching to within about two centimeters of the midline. The inner pole was three centimeters above the orbital roof, as seen in the frontal roentgenogram.

Operation, September 28, 1929, was performed entirely under local anesthesia. The patient had 1/6 gr. of morphin and 1/50 gr. of atropin beforehand. Towels were sewed to the area previously injected with 0.5 per cent novocain, outlining the field of operation. This suturing of the towels to the skin freed us from embarrassing flapping clamps. The patient was lying on the right side with the head supported beyond the table on an outrigger head rest. Heidenhain's interrupted stitches (catgut) were used for hemostasis on the outer side of the field and at the base of the flap, forming a complete circle.

The skin was incised inside the constricting hemo-

static sutures. The flap was a little larger than the palm of a man's hand. There was scarcely any bleeding; only three or four artery forceps were applied. The periosteum was freed inward and outward along the line of incision. With De Martel's cranial drill five holes are made and with the fraise (also of De Martel) the openings were united by cutting a channel about three millimeters wide. This apparatus worked admirably and saved much time. The flap was then broken out after a cut by a Doyen chisel on each side of the base. After raising the flap there was considerable bleeding from the very tense dura. This was checked by compression with an adrenalin-saline-soaked gauze sponge. Hardly any pulsation was felt.



Fig. 15. Case 3. Calcified psammoma.



Fig. 16. Case 3. Psammoma; section through middle. Note areas of necrosis and liquefaction in central portions.

Another hypodermic of 1/6 gr. of morphin and 1/150 gr. of atropin was now given, as the patient was afraid of an epileptic attack coming on. However, it did not develop and seemed to be warded off by the hypodermic and by patiently waiting. The dura was then cut, leaving a rather broad base for this flap postero-inferiorly. In the lower part of the wound a dark grayish area was noticed and the ordinary brain formation was not seen. There was some edema of the pia-arachnoid. On palpating the index finger entered between this tumor and the rounded stretched-out adjoining convolutions. Very gradually, in order not to damage the adjoining brain, we freed the tumor, which was much harder than the brain and was well outlined. The circumference of the tumor was greatest about one or one and a half centimeters inside the surface of the brain. Gradually the finger reached to a depth of about three or four centimeters. The tumor was smaller further in and it was possible to loosen it with the finger. Finally the tumor was rather readily lifted out. Only anteriorly did it seem that the adjoining parts were somewhat shreddy; they looked like bulky suffused pia-arachnoid. Bleeding was moderate and was controlled by a wet gauze pad held gently over the brain surface. The large size of the opening in the skull and dura undoubtedly helped in preventing damage to the brain.

The patient was again threatened with a convulsion. She screamed that she very distinctly felt its coming on. She then received a third hypodermic of 1/6 gr. of morphin and 1/150 gr. of atropin. Again the attack was warded off. After a short pause the dura could be stitched back into place, though the tension seemed too great to protect more than the posterior two-thirds of the exposed brain. Healthy brain was presenting in the antero-superior part of the bone flap; however, it was protected by the uninjured lepto-meninges. The bone flap was fixed by three finest periosteum silk sutures. Linen suture of galea and skin was used. The operation lasted one hour and forty-five minutes.



Fig. 17. Case 3. Appearance of wound on day of discharge from hospital, sixteen days after operation.

Before sewing up, the patient declared she had not had any pain during the operation. The last skin stitches were, however, felt.

The general condition of the patient at the end was remarkably good. Loss of blood amounted to between three and five ounces. Blood pressure at the end of operation was 111—82.

The weight of the tumor was 66 grams.

At the end of the operation the pulse was 140, but an hour later it had come down to 116 and was regular and strong. On the following morning it was 99. Before putting on the dressings, two of the Heidenhain stitches were removed to assure sufficient circulation. The others were left to be absorbed or cut later on.



Fig. 18. Case 3. Low power. The black areas are the calcified psammomatous kernels.

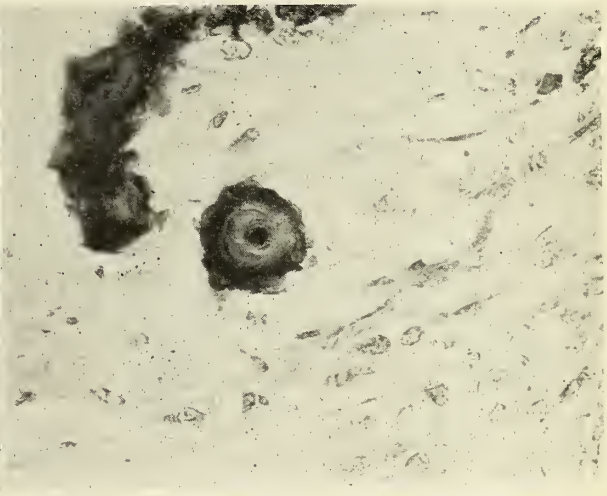


Fig. 19. Case 3. High power. Calcified amyloid body.

The first few days the patient vomited a number of times and complained now and then of pain in the head. On several occasions she had a numbness in the right hand and arm. On the day after the operation she stated the right arm and hand and the right cheek had twice felt as if they were falling asleep. This was similar to her previous prodromal symptoms. It lasted two minutes and then was gone. These sensations of numbness had disappeared after three days. On September 29th (the day following the operation) we made the note that the patient was very bright. Her right grip was a little less powerful than her left, while the sensation was equal in both hands. The facial muscles acted normally; she could whistle; she had no headache when we visited her. Both feet moved normally. She was wide awake generally and when we were leaving she wanted us to have some of the fine fruit that had been brought her.*

On September 30th, forty-eight hours after the operation, the right hand could hardly be closed and opened. There was no pain in it, while the day before it had hurt. The tongue felt numb and was sluggish. The patient was mentally much more dull than on the day before and seemed half dozing. The speech was indistinct and thick. On October 1st (three days after the operation) after a good night she seemed a little better. The right hand moved voluntarily but slowly and weakly. When asked if she had headache she answered, "Just a little, less than yesterday." She was still dull and sleepy, though she asked for a magazine and looked at the pictures.

On October 2nd, the patient smiled, looked and felt much better. Power in closing left hand was 21 kilograms by dynamometer; in right hand 12.5 kilos (patient is right handed). Pupils were equal and reacted normally. She differentiated the sharp and dull end of a nail file very promptly on both hands; also heat and cold.

Four days later I find the note: "Olfactory, gustatory senses and hearing normal. Patient out of bed." At times the right, but mostly the left hand showed the more powerful grip.

While the patient had had four convulsions on the day preceding the operation, she has not had a single one since the operation (three months). A few hours after the operation the temperature had shot up to 103.2° and stayed rather high (ranging between 100° and 103°) for ten days till the sutures were all removed. The general condition was disproportionately good and the leukocyte count reached only once as high as 10,300, to recede two days later (October 9th) to 8,950, though even at this latter date the temperature reached 101.4°. The wound looked good, but there was oozing of cerebro-spinal fluid along some stitches. This may account for the apparently aseptic fever. Sixteen days after the operation the patient left the hospital in excellent spirits and the wound was healed as the photograph, taken on that day, shows. The right hand and fingers still felt a little numb on October 18th, but the patient was perfectly normal otherwise according to the members of the family.

Microscopically the tumor was a psammoma. Topographically the tumor apparently developed from the

*This is mentioned as Hughlings Jackson (see Marion Hines "On Cerebral Localization" in "Physiological Reviews," edited by the American Physiological Society, July 1929) differentiates forms of speech: (1) voluntary or intellectual or propositional speech, which suffers most in cortical lesions; (2) emotional speech—ejaculations, swearing, which is more primitive and is unaffected by cortical lesions (the same words cannot be repeated after the emotion has passed); (3) what he calls "common speech," little sentences where (1) and (2) are interwoven. Pierre Marie considers the "center" of speech spread over a very large part of the lateral surface of the left hemisphere.

leptomeninges of the first temporal sulcus or possibly from the sylvian fissure.

SUMMARY

The three patients represent three very different lesions. The first one had a tumor of the cerebello-pontile angle. The second had an intracranial aneurysm of the left carotid artery directly above the optic chiasm and the third patient had a large psammoma in the left temporal region.

The improvement in the first case consisted of saving her vision, of mental restitution, of relief from nystagmus, ataxic gait, and of the paresis of the motor and sensory portions of her fifth nerve. This improvement had steadily progressed till now, two years after the operation.

In the second patient the remnant of eye sight, which had not yet been destroyed by the optic atrophy, was preserved and the vision has even somewhat improved, enough so that she is again a useful member of her family. The pain in her face and head is relieved and the improvement is apparently permanent.

The third patient who suffered from daily epileptic attacks for two years and four months, is, so far, completely relieved and the outlook for the future is good.*

All three cases were operated upon entirely under local anesthesia.

The reason for presenting these patients is to counteract the nihilism of despair which is found quite frequently among us and which has its disastrous effect in leading to procrastination.

*Patient has not had an attack up to the time of proofreading of this paper, ten months following operation.

THE DEVELOPMENT OF PUBLIC HEALTH NURSING

At the invitation of the United States Public Health Service, Miss Ada Newman, of the Wisconsin State Board of Health, recently prepared a statement concerning the public health nursing movement. The following is a résumé of some of the outstanding points.

Growth of the public health nursing movement in the United States was at first very slow. With the development of preventive medicine, however, the demand arose for teachers who could spread the fundamental principles of disease prevention to parents, school children, teachers and employers. After 1905, growth became more rapid and at the beginning of the World War the pioneer stage drew to a close. Well-established organizations were to be found throughout the country and a growing consciousness of state and municipal responsibility was becoming manifest. It was then that the public health nurse came into the field as an active promoter of health measures.

It is obvious that hospital training alone does not qualify a nurse to meet the obligations of public service. To meet this need for more adequate preparation many of the leading universities are offering postgraduate courses to registered nurses who have sufficient academic background to enable them to matriculate.

Public health nurses are found in large numbers in the original task of caring for the sick in their own homes. These nurses are graduates of three-year hospital training courses and were either taught visiting nursing by the staff school or took a postgraduate course.

The next largest service of the public health nurse is that of school nurse. She assists the health officer in communicable disease control, aids the school physician in examination of school children and makes home visits to interpret the findings and advice of the physicians to the parents.

Public health nursing is recognized not only from a humanitarian point of view and as an educational force but also on the basis of commercial value. This is demonstrated by the fact that business concerns employ nurses in large numbers, believing that, in order to have their plants operate on a more efficient basis, the health of the employes and of their families should be protected. Insurance companies also employ many nurses to work among their policy holders. When we consider that the only motive back of industrial nursing is a financial saving for the employing body, it speaks very highly for the economic value of such service.

The latest nursing activity to be developed in the United States is rural community nursing. These rural programs are planned to cover in part health educational work for the adult and for the school child, infant welfare, and the prevention of communicable diseases; in short, all phases of nursing service.

The demand for public health nurses greatly exceeds the supply. There are approximately 12,000 graduate nurses employed as full-time public health nurses in the United States at the present time. Many of them are doing pioneer work in rural communities and small cities and are carrying work sufficient for two or more nurses.—*Health News,* July 7, 1930.

PERICARDITIS*

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IN attempting to discuss a subject so familiar as inflammation of the pericardium, I do not desire to attempt a consideration of all of its various aspects. I do desire to emphasize certain diagnostic points, which seem to be of most value, and to call attention to certain errors and fallacies which, although they have been pointed out from time to time, still seem to persist.

For my purpose I shall cite personal experiences, and make reference to an unselected group of cases, compiled from the records of the Minneapolis General Hospital, during the past five years.

Sibson[1] presents an encyclopedic clinical discussion of pericarditis, as it occurred in his practice in St. Mary's Hospital, in London. Out of a total of 326 cases of acute rheumatic fever, sixty-three cases were affected with pericardial inflammation, fifty-four of which had endocarditis. Carefully analyzing the sex, age, and occupational factors, his tables show the two sexes affected in equal proportions below the age of twenty-one, while above the age of twenty-five males were affected three times more frequently than women.

In a group of 150 cases collected by Locke,[2] from 3,600 necropsy records at the Boston City Hospital, and in a series of seventy-eight cases, reported by Robey,[3] acute rheumatic fever was not an important etiological factor. This experience is in conflict with that of Sibson in whose series pericarditis occurred in approximately one-fifth of the reported cases. In seventeen of thirty-nine cases of acute fibrinous pericarditis, observed by Christian,[4] the pericardial inflammation accompanied or occurred just subsequent to the attack of acute rheumatic fever. Of Preble's[5] 244 cases of acute pericarditis, sixty-five occurred in relation to acute rheumatic infection. In addition to acute rheumatic fever, acute pericarditis is most commonly associated with pneumonia, local or general sepsis, and nephritis. Acute infections, such as diphtheria, scarlet fever, cerebro-spinal meningitis, erysipelas, are well known causes. Tuberculosis, occurring in 10 per cent of Preble's cases, occupied a more important place as a causative factor than in most other series. Then too it is observed as a terminal or coincidental event in cases of arteriosclerosis, hypertension, aneurysm of the aorta, mediastinal and lung tumors. Occasionally trauma is responsible for its occurrence.

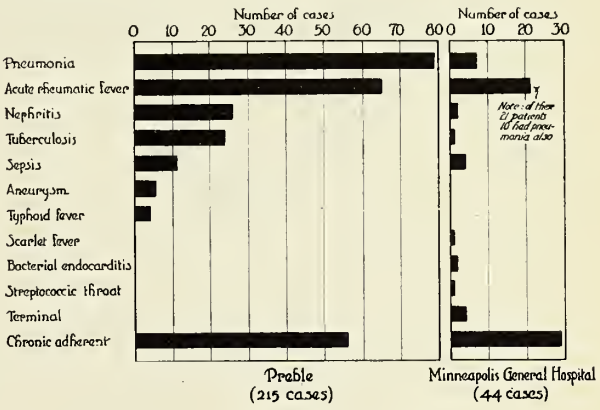


Chart 1.

From the records of the Minneapolis General Hospital during the past five years, there were found to be forty-four cases classed as acute pericarditis, most of which were seen by myself either on the medical service, or in consultation on some other service. In this group twenty-one occurred in relation to, or complicating acute rheumatic fever, or in a few instances rheumatic infection, such as acute tonsillitis, without the presence of swollen or enlarged joints. Seventeen of the patients had pneumonia, either bronchial or lobar, ten in association with their rheumatic infection, and in seven the pericarditis occurred as a complication of the pneumonia. In four cases the patients suffered from subacute bacterial endocarditis (one of these being a general septicemia associated with septic abortion). One case occurred as a complication of scarlet fever. One case was proven to be due to tuberculosis, and two complicated uremia. One case followed an acute streptococcic infection of the throat. Of the twenty-one rheumatic cases, twelve had a history of previous rheumatic infection, and also of these twenty-one cases, nineteen had evidence of mitral valve disease, either alone, or in association in 9 cases with aortic

*Thesis presented before the Minnesota Academy of Medicine, March 12, 1930.

valve disease. One case of carcinoma of the lung had a large hemorrhagic effusion into the pericardial sac, although in this case the carcinoma had not invaded the pericardium, and the source of the hemorrhagic fluid was not apparent from the autopsy report. In three cases of hypertension with cardiac decompensation, as well as in one case of severe purulent bronchitis, the pericarditis developed as a terminal event. The diagnosis of pericardial infection was made clinically in all but five cases, either by the finding of definite pericardial friction rub, or the discovery of pericardial effusion, either by physical signs, or by the roentgen examination, or both. There were no cases caused by the gonococcus. Pericarditis following occlusion of the coronary arteries, strangely enough, was found to occur only once in this group.

It is perhaps surprising that subacute bacterial endocarditis does not appear more prominently in a pathological relationship to pericarditis, for in the pathological studies made by Clausen and Bell,[6] pericarditis occurred practically as frequenty in those diagnosed as subacute bacterial endocarditis, as in rheumatic fever.

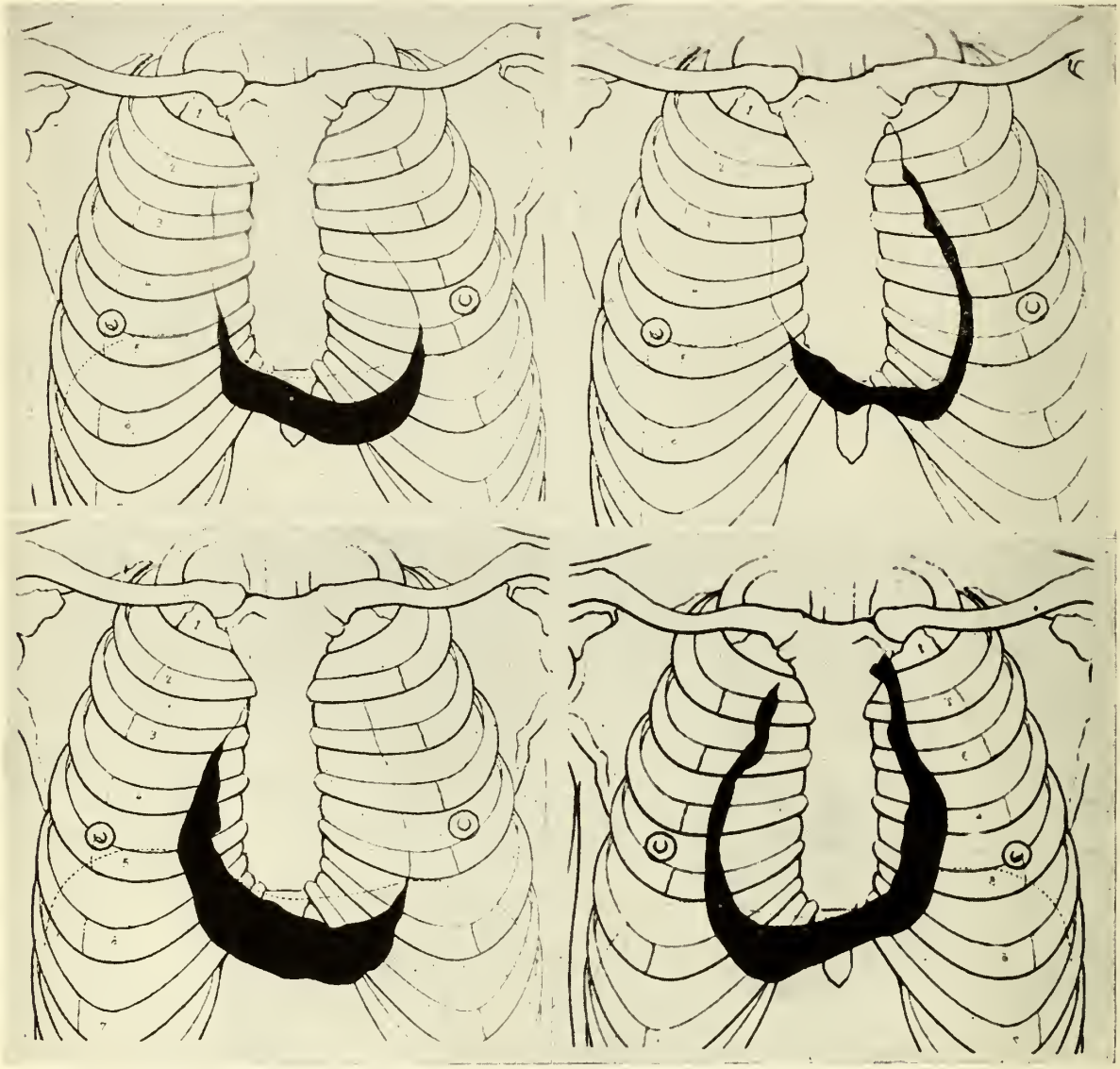


Fig. 1. Locations of accumulations of pericardial effusions. (Williamson.)

The relation of acute fibrinous pericarditis, with or without effusion, to acute rheumatic fever, and to pneumonia and pleural infection, is so well known, and so well established, that it hardly seems necessary to discuss it at length.

The use of the term idiopathic to describe types of unknown etiology seems to be of no particular assistance in classification. Perhaps it would be better to classify this group bacteriologically and

absent, or may be of a very sharp, stabbing character. Usually it is felt over the heart, but it may radiate into the abdomen, to the left side of the neck and shoulder." MacKenzie[8] states "dry

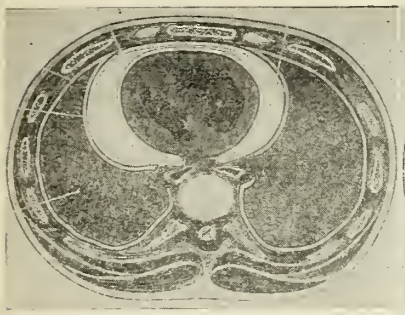


Fig. 2. Semidiagrammatic view of a transverse section of the thorax showing the disposition of the liquid in a small pericardial effusion. (From Curschmann.)

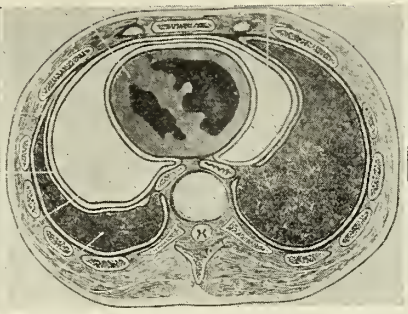


Fig. 3. Transverse section of the thorax (semidiagrammatic) showing the location of the liquid in pericarditis with moderate effusion. (From Curschmann.)

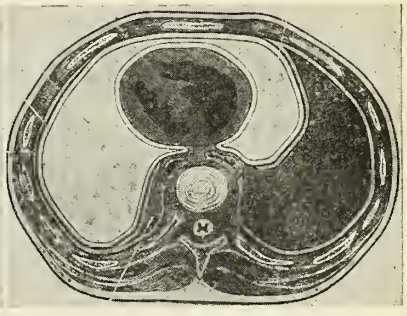


Fig. 4. Disposition of the liquid in a large pericardial effusion. Note the compressed left lung indicated as lying against the vertebral column. (From Curschmann.)

recognize that the path of invasion in these infrequent cases is not known. From a pathological standpoint subdivision may be made on the basis of the character of the exudate: fibrinous, sero-fibrinous, serous, fibrinopurulent, and purulent.

Necropsies were performed in nineteen instances. In the majority of these the exudate was characterized pathologically as fibrinous, serofibrinous, or fibrinopurulent. This exudate consisted of fresh, loose, strands of fibrin covering the pericardium in part or entirely. In eleven instances the amount of fluid was so small that the quantity was not estimated, and in two cases the loose fibrin was obviously purulent. In five other cases in association with fibrin there were amounts of fluid varying from 25 to 200 c.c., and in three the fluid was obviously purulent. In eight cases the accummulation of fluid only is mentioned, this being a clear, yellowish color, varying in amounts from 25 to 200 c.c. The 1000 c.c. accummulation of bloody fluid occurred in the case of primary lung carcinoma. The cases with the frank purulent exudate occurred in the cases of general septicemia, pneumonia, and in three instances, where the pericardial inflammation was a terminal event. In a few cases there were found old adhesions side by side with acute inflammation.

Nearly all authors comment on pain as a symptom of pericarditis, although their statements indicate that this is a variable factor. Norris and Landis[7] assert "Pain may be entirely pericarditis is essentially a painless complaint. This curious painlessness has long puzzled me. When pains are associated with pericarditis it will invariably be found that there is evidence of myocardial affection." McPhedran[9] says that pain is generally present. Sibson[1] found it in 70 per cent of his cases. Schroetter[10] states that the greater number of cases occur without pain. Poynton[11] says that it may occur with little discomfort, and no pain. Babcock[12] found pain in the majority of his cases, or at least a sense of distress. Blumer[13] states that pericarditis is often almost without pain. Billings[14] does not mention pain in his text, and in only one case history. In seventy-eight cases in Robey's[3] series pain was not a striking feature, and was observed twenty-six times. In seventeen of the twenty-six cases there was either acute pneumonia or disease of the pleura, in two others chronic disease of the myocardium, and in one aneurysm of the arch of the aorta, leaving but six cases out of the twenty-six with pain directly over the precordium. In the two cases of purulent pericarditis pain was not observed at any time. Robey observes that a good many patients with acute disease of the heart, while they do not have actual pain in the heart, generally say that local applications of ice make them feel more comfortable. Albutt states that there are cases in which the pain is like that of angina pectoris.

From a clinical and experimental study Capps[15] concluded that stimulation of the lateral walls of

the pericardium did not produce pain. Puncture of the pericardium at the level of the fifth and sixth interspaces produced phrenic nerve pain. Puncture at the level of the fourth interspace

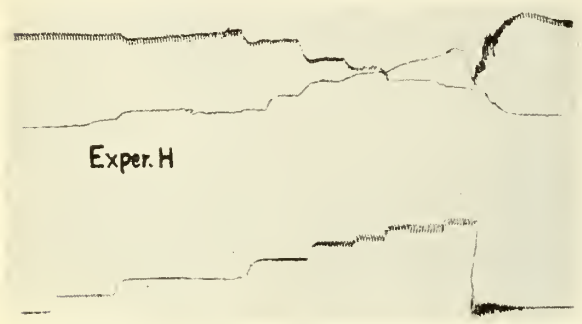


Fig. 5. Tracing showing the effect of increasing intra-pericardial pressure upon arterial and venous pressures. (Williamson-Ets.)

did not cause pain. He infers that the phrenic nerve supplies the central diaphragm and at least the lower portion of the fibrous pericardium. He believes the presence of pain in pericarditis usually indicates involvement of the tissues outside of the pericardium, especially the pleura.

In six of the present group of cases, no pain was complained of; in seven the patients complained of abdominal pain; and in three of these it was localized to the epigastrium. In the others it was spoken of as diffuse, more often of a dull rather than severe character. In the remaining cases chest pain was complained of, in eight of these characterized as precordial, in a number of others being mentioned only as left sided pain. In two instances it was complained of as being substernal. In one instance it occurred in the region of the left scapula. This varied from severe, sharp, lancinating pain to a dull sense of pressure or only a soreness. It is often increased by movement, deep breathing or coughing. Not infrequently patients were observed leaning far forward in bed, a posture which has been described as characteristic. In some instances pressure over the precordium aggravated the symptom, and tenderness was elicited. A finding mentioned in only two of the records, but which, from my experience, I am inclined to believe occurs more often than it is looked for, is hyperesthesia over the precordium.

My own experience leads me to believe that pain of some type is met with as a symptom in patients who have pericarditis. I believe that sharp and severe pains, stabbing in character, are more often associated with pleurisy, rather than its being due to the involvement of the pericardium itself. Certainly in the majority of the rheumatic cases where pleurisy is not a factor, as well as those cases occurring as a late complication of pneumonia (in these the manifestation of the acute pleuritis having subsided), the complication is either attended by no pain whatever, or else a sense of precordial discomfort or oppression. In certain instances the pain, if present, or the discomfort may be aggravated by pressure or definite tenderness may be elicited over the precordium.

Dyspnea is not infrequent although it may not appear until in an advanced stage of the disease, and more often than not is the circumstance one of increased rapidity of breathing rather than any marked subjective discomfort.

Dysphagia was not observed in any of the present series of cases. Sibson[1] mentioned difficulty in swallowing in thirteen cases. In none of the present series was loss of voice observed, although in a few the voice was husky and this may have been due to affection of the left recurrent laryngeal nerve.

Coma and delirium, commented upon at length by Sibson, only occurred in the present series of cases when they could be readily accounted for by the toxemia and hyperpyrexia.

The outstanding physical sign and the one which is most diagnostic is the pericardial friction rub. As a rule this was identified with the greatest of ease, being characteristically to and fro, being heard toward the base of the heart, the apex, or over the entire precordium. The quality of the sound varied very greatly from a fine rather high pitched, not necessarily intense, and of a grating character, to the very loud, harsh, leathery rub which occasionally may be detected on palpation, as friction fremitus. In one case of infarction, due to coronary thrombosis, the rub easily distinguishable as such, varied markedly from time to time, occasionally being very definite, and at other times hardly audible. After several days, in this particular instance, the sound became very soft and distant, and could easily have been mistaken for a soft blowing murmur. Although many authors have repeatedly commented upon the error, it still seems to be a prevalent idea that the accummulation of fluid within the pericardial sac necessarily causes

a disappearance of the friction sound. I have repeatedly carefully examined, day by day, patients showing a pericardial friction rub, the friction rub persisting at each examination while at the same time noting the widening of the percussion borders, and by roentgen examination have shown that fluid was accummulating within the sac. Williamson[16] states that the friction rub not only may, but does persist with large effusions in two-thirds of the cases. He believes that this is due to a large heart. Conner[17] comments upon the persistence of the pericardial friction murmur during an effusion.

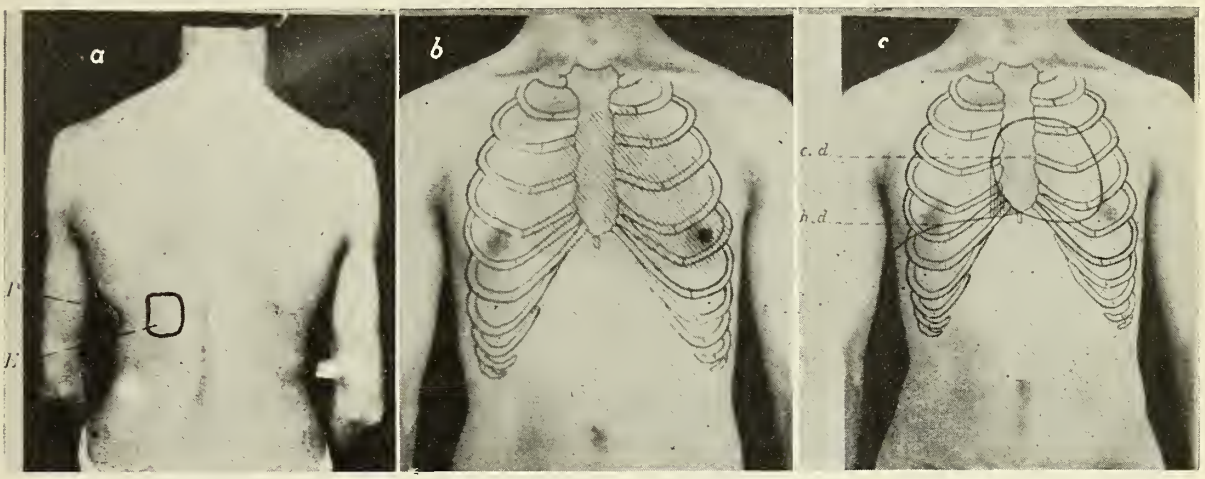


Fig. 6. Physical signs of pericardial effusion. (Babcock.) a. Location of pulmonary changes in Pins' (P) and Ewart's (E) signs of pericardial effusion. b. Apex beat and area of cardiac dullness in case of pericarditis with effusion. c. Rotch's sign of beginning pericardial effusion—dullness in shaded area or cardio-hepatic angle: *c. d.*, cardiac dullness; *h. d.*, hepatic dullness.

Evart[18] and later Christian[19] have called attention to the frequency of the so-called pulmonary compression signs, occurring over the left chest posteriorly. Evart mentions the area of dullness with tubular breathing and egophony occurring near the angle of the scapula. The area may be small or large. Christian calls attention to the fact that these signs may be demonstrated even when there is little or no demonstrable fluid present in the pericardium. Christian attributed this sign to atelectasis. He mentioned, however, the possibility of the presence of a pleural effusion as well as pulmonary infection, which often occurs, and which might confuse one in this interpretation. Inasmuch as these posterior signs are present with quite small, as well as larger effusion, I believe that the percussion findings may be accounted for in the same way as Skodas tympany is accounted for in other situations. I believe, however, that with very large effusions, atelectasis is brought about, and in such a condition signs may be accounted for in quite the usual manner. It might be of interest to comment here upon Connor's belief that the compressed lung in large pericardial effusions lies not against the vertebral column, but against the ribs, in the region corresponding to the posterior part of the axilla. He says that it is difficult for him to see how the compressed lung can ever lie against the vertebræ, for as the pericardial pouch enlarges and begins, below the root of the lung, to extend backward along the side of the bodies of the vertebræ, it must, it would seem, work its way between the vertebræ and the inner surface of the lung. With effusions of considerable size, prominence of the precordium may be observed in children, though rarely in adults. Various percussion signs have been described; some of them obviously are of great diagnostic importance. Morris and Bader[20] state that 250 c.c. of fluid in the pericardial sac is often sufficient to be demonstrated by percussion. Widening of the area of dullness, and widening of the roentgen shadow in the first and second interspaces occurs relatively early, and is best determined with the patient in the recumbent posture. Narrowing of this dull area, with a corresponding decrease of the shadow over the great vessels, when the patient is changed from the recumbent to the erect posture, is considered a most reliable sign of fluid in the pericardium. Rotch's[21] name attaches to a percussion sign which he considered diagnostic of pericardial affusion. This was the absence of resonance in the fifth right intercostal space. Hess[22] advo-

cated auscultatory percussion as a means of diagnosis in pericardial effusion. Dullness over Traube's space may be obtained.

Williamson[23] injected the pericardium with glycerin and agar and made casts. He shows that the fluid accummulates first in the lower portion of the pericardium, and that moderate amounts (500 c.c.) of effusions will serve to push down the left lobe of the liver. Evart[24] in his twelve diagnostic points mentions depression of the liver, as one of the signs of pericardial effusion. Williamson, by his injection method with small and medium amounts of fluid (350-600 c.c.) was unable to satisfactorily demonstrate Rotch's[21] sign, nor the sign described by Ebstein,[25] that is, a rounding of the cardial hepatic angle. Williamson stated that the behavior of the fluid was independent of the position of the patient, and from his experiments concluded that the best location to reach a small amount of fluid with the exploring needle was either just outside the apex or in the chondroziphoid angle (Marfan's point). Various authors have different choices as to the most desirable point of inserting a needle, or doing a paracentesis. Pendlebury[26] states that this is best done in the fifth left intercostal space, one inch from the margin of the sternum. Connor states[17] that the needle should be inserted either at a point well to the left and below the position of the apex beat, or over the area of flatness posteriorly. He prefers the posterior tap, as being the simplest and safest. I have aspirated at this site, and also in the fourth and fifth interspaces, just to the right of the sternum. Williamson and Ets[27] make a plea for not delaying aspiration too long. They state that a not inconsiderable number of patients, with uncomplicated pericarditis with effusion die as a result of pressure from the exudate mechanically shutting off the great veins. This danger is not necessarily proportionate to the size of the exudate, but rather to the rapidity with which the effusion develops. A steady fall in the arterial pressure, and particularly a sudden increase in the rate of fall is a direct indication for therapeutic puncture. In supporting their contention they performed the following interesting experiment. To determine the relation between arterial, venous, and intra-pericardial pressures —with cannulas inserted into the carotid artery and jugular vein, to record the arterial and venous pressures, they inserted a cannula into the pericardium and injected physiological salt solution. The pressure within the pericardium was gradually raised until the heart stopped beating. The increase in pericardial pressure caused a steady rise in the venous and a steady fall in the arterial pressure. In my experience, it has seldom been necessary to do paracentesis in rheumatic pericardial effusions.

In 1873 Kussmaul[28] described as a characteristic symptom of the obliteration of the pericardium, change in the arterial pulse, it becoming smaller or disappearing entirely on inspiration, and returning to normal on expiration, so-called pulsus paradoxus. Gauchat and Katz[29] described a case of pericardial effusion, which brought about this change in the pulse, and noted that the abnormality disappeared after pericardial paracentesis.

Following the suggestion of Wenckebach,[30] injections of air into the pericardium following aspiration has been done with the idea of preventing formation of adhesions. Troisier, Jacquelin, Gayet[31] and Castex[32] report cases treated in this manner. One case of tuberculous pericarditis, with a large effusion, has come under my observation, which had pneumopericardium performed. The procedure, no doubt, will not have widespread application.

There has been much discussion and comment as to whether the heart is displaced in event of the accummulation of pericardial effusions. Calvert[33] states that the position of the heart in pericarditis depends upon the size of the heart, and that the size in turn is dependent upon the degree of distention or amount of blood within the heart. While compensation is maintained the heart contains a relatively normal amount of blood, and is in a relatively normal position. When compensation fails the amount of blood delivered to the heart is diminished. The heart becomes smaller and smaller until collapsed, the size of the heart varying inversely as the pericardial pressure. The apex is in the normal position, or displaced slightly backward or to the right.

Nephritic and uremic states frequently have associated pericarditis. Bright[34] reported an incidence of 8 per cent, Sibson the same, Preble and Barach[35] each 11 per cent in 300 and 162 cases respectively. At autopsy little fluid is found as a rule, but usually there is a thick bread-and-butter-like exudate, covering the entire precordial

surface. In only four of Barach's cases did the culture show pyogenic organisms, and in these cases the inflammatory reaction was of the polymorphonuclear type. In the cases in which no

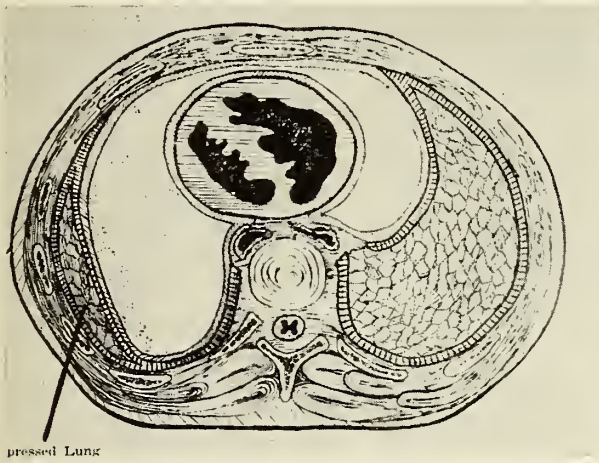


Fig. 7. Semidiagrammatic section illustrating author's view as to the usual position of the compressed left lung in the presence of a large pericardial effusion.

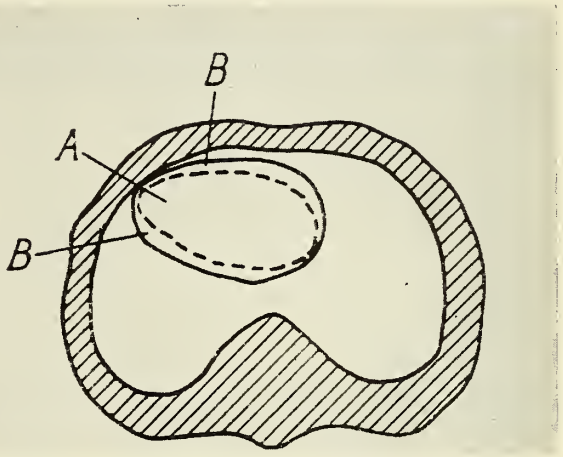


Fig. 8. Cross section of thoracic wall and of heart. Dotted line = size during systole. (Connor.)

growths were obtained the reaction was of the mononuclear type. In 90 per cent of Barach's reported cases the diagnosis was made by the presence of a friction rub. The average length of life after the appearance of the rub was twenty-nine days, although one patient lived as long as one year. In one case, under my observation, the friction rub was observed in September, and the patient did not succumb until the following March. The immediate cause of death in this case was pneumonia.

Attempts have been made to identify conduction changes which might be considered as an aid in the diagnosis of pericardial effusion. Oppenheimer and Mann[36] found electrocardiographs of low voltage associated with large effusions. These were not necessarily associated with change in shape, although it is conceivable that the effusion may alter the electrical axis in some cases, or cause other changes in the propogation of the electrical impulse. Large effusions may fail to effect the voltage appreciably in certain cases. Gauger[37] pointed out the effects of increasing intra-pericardial pressure on systemic blood pressure, as shown by Lewis[38] and refers to investigations by Kuno[39] who showed that the circulation ceased when the intra-pericardial pressure equalled the venous pressure. He reports a case of auriculo-ventricular block accompanying a large pericardial effusion, and shows tracings after paracentesis which were normal. He believes that this is due to compressive effect of the pericardial effusion upon the coronary circulation. The contention that low wave amplitude might be considered evidence of pericardial effusion was certainly not indicated by the electrocardiographic tracings in the present series, the signs observed in these being only those which could be explained by the cardiac pathology, or, as was the case, quite normal appearing tracings.

ADHERENT PERICARDIUM

Discovery of adherent pericardium during life is in many cases impossible, and in some doubtful or difficult. When the adhesions are partial, when the heart is small or when the relation between the heart and lungs is undisturbed, the diagnosis at best is doubtful, and if made rests upon speculation only. Vaquez[40] states that where layers of pericardium are simply adherent the condition is often unrecognized and is relatively benign. When, however, in association with the adhesion of the two layers of the pericardium, one to the other, adhesions are also present to the neighboring structures, the heart becomes immobilized in the chest and will have its function materially interfered with, decompensation eventually resulting. Just as acute pericarditis has many and varied causes, so the result, adherent pericardium, has the same causative factors, namely, the infectious diseases, pneumonia, scarlet fever, rheumatic infections, tuberculosis, nephritis, malignant disease, and occurs in association with, and as a result of such conditions as aneurysm and mediastinal tumors. The adhesions may be partial or com-

plete, varying greatly in extent and consistency. Partial adhesions take place most frequently near the apex and along the line of the ventricular septum, and the outer side of the right auricle, also about the base of the heart in the region of the great vessels; in short, where the extent of the movement of the heart is least. Adherent pericardium is one of the frequent causes of enlargement of the heart. Sibson compared a group of cases of valvular disease, in which the pericardium was adherent, with the same type of cases in which the pericardium was not adherent. The weight of the heart in cases of valvular disease with adherent pericardium (13 cases) averaged 120 grams, larger than those hearts with valvular disease, but without adherent pericardium (63 cases). Head[41] studied fifty-five cases of chronic adherent pericarditis, all of which were verified by post-mortem examination. He subdivides his cases into three groups: first the silent group (five cases), there being no subjective or objective symptoms, and the true nature of the disease being discovered only at autopsy. In his second group (67 per cent) the symptoms and physical signs pointed to a disturbance of the circulation, and congestive failure was the outstanding feature. His third group (eleven cases) were those commonly known as Pick's disease, the symptoms and signs of this group suggesting cirrhosis of the liver. Pick[42] sums up the results of his observations as follows: "There is a symptom complex which is deceptively similar to the mixed forms of cirrhosis (with swollen liver, marked ascites, but without icterus) and which is due to the fact that the circulatory disturbances caused by a latent pericarditis lead to proliferation in the connective tissue in the liver, and having, as a result, through stoppage of circulation in the portal vein, very highgrade ascites. This condition occurs generally in young individuals, but it is also observed in later years. The following points are guides in the differential diagnosis; the failure of the etiological factor for cirrhosis of the liver; the anamnestic report of previous pericarditis and previous edema of the legs. Systematic examination of the heart can alone lead to a trustworthy result."

Discussion of Cases. Twenty-eight cases were classed as adherent pericarditis. In reviewing the records, it was believed that from the recorded data in eight cases there was insufficient evidence at hand to properly make such a diagnosis. Of the twenty cases, thirteen had definite history of previous rheumatic infection. In most of these, this was a true rheumatic fever, although in the case of two or three, repeated attacks of tonsillitis or attacks of chorea were included. Of the remaining seven cases one was associated with syphilitic aneurysm of the aorta, one was associated with chronic pulmonary tuberculosis, and a third had had an occlusion of the coronary artery. One of the patients who had a history of previous rheumatic infection, but had no evidence of endocarditis, suffered from congestive failure, which was the result of an essential hypertension. This patient's history included a previous hospital admission, when he had suffered from an acute pericarditis. Sixteen were considered to have definite evidence of valvular disease, either mitral or aortic involvement, or both. Eleven cases had rather definite congestive heart failure of varying degrees.

Enlargement of the heart is an almost invariable accompaniment of adherent pericarditis, and is of such frequency as to make difficult the drawing of hard and fixed lines of differentiation. The latter lesion undoubtedly produces cardiac hypertrophy, and subsequently dilatation. Some of the largest hearts, met with at the necropsy table, can be accounted for in this way.

In cases of adherent pericardium retraction of the lower ribs opposite the attachment of the diaphragm on the lateral or posterior aspect of the thorax may sometimes be seen. This sign, to which Broadbent's name is attached, was considered by him, and is probably still to be considered a most important finding, when present. This phenomenon is best seen when the patient is sitting in a good light, the thorax being inspected tangentially from behind, and is more often seen on the left side. It may also be observed on the right, and when so observed is of even greater importance. It is more marked when deep inspiration is made. Broadbent[43] says: "Here, it is not possible that the heart can be directly fixed to the chest wall, at the points of retraction by pericardial adhesions, as the lung tissue intervenes; but the explanation seems to be the following: The heart is, by means of the pericardium, adherent not only to the central tendon of the diaphragm but probably also to a large area of the fleshy or muscular portion of the diaphragm, and it may be, to the anterior thoracic

wall as well. As it contracts it drags upwards and inwards the less resistant fleshy part of the diaphragm towards the central tendon or anterior chest wall; hence the points of attachment of the digitations of the diaphragm to the lower ribs and costal cartilages are dragged inwards and downwards."

While commenting on the important significance of this sign, I need to specify that it is not pathognomonic. In five autopsies on patients with adherent pericardium, in the present series, Broadbent's sign was observed and recorded in only one. Also I might mention a patient with tremendous cardiac hypertrophy, the result of a long standing hypertension, in which systolic retraction was seen during life on both the left and right sides posteriorly. The necropsy did not show any involvement of the pericardium or surrounding structures.

The pulsus paradoxus of Kussmaul[27] previously referred to, may be considered one of the important signs, which may occur as a result of an adherent pericardium. Kussmaul explained his conception in the following way: "Pericardium thickened, partly by callous membrane and fibrinous growth, inside as well as out, partly through increased thickening of its fibrinous layers, causing a definite inclination to obliterate the cavity. In the mediastinum it produces a callous skein and compact threads, which extend upward from the pericardium to the arch of the aorta, innominate vein, surrounding the stem of these vessels, drawing, kinking, and twisting them, binding the arch against the pericardium, and joining the vessels directly to the upper part of the breast bone. The pulse in all of the arteries will be small or disappear entirely during inspiration, and return to normal during expiration. The veins in the neck, especially the bulb of the jugular vein, will be swollen during inspiration." Kussmaul further cautions that a paradoxical pulse can occur in other conditions found in the mediastinum, and that a careful consideration of the symptoms and physical signs, as well as history, must be considered before making a diagnosis of mediastino-pericarditis.

Gauchat and Katz, already referred to, considered in two papers the causes of pulsus paradoxus. They considered the occurrence of this phenomenon and abnormality of the respiratory tract, and believe it to be produced by modifications of the intrapleural pressure. They experimentally showed that adhesions need not be attached to any particular vessel, but may be fastened anywhere between cardiac structures, and thoracic parietes, and still be capable of producing pulses paradoxus. Mechanical compression of the aorta produces an immediate effect upon the amplitude of the pulse. Compression of the pulmonary veins caused a decrease in pulse amplitude after one or two beats, and compression of the vena cava had the same effect after three or four beats.

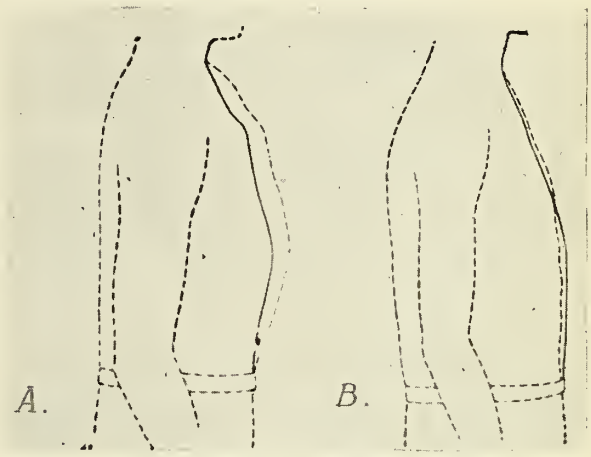


Fig. 9. a. Normal respiratory profile. Solid line, deep expiration; dotted line, deep inspiration. b. Wenckebach's crossed profile.

All of the signs advanced as indications of adherent pericardium, Skoda's[44] "dimpling," retractions of the chest anteriorly and posteriorly, retraction of the epigastrium, percussion changes obtained with the patient in various postures and during various stages of respiration, the extent of the absolute dullness and its relation to the superficial dullness, Wenkebach's crossed respiratory profile, are not pathognomonic. The character of the apex beat, and the diastolic shock are of doubtful significance. Abnormal filling of the neck veins, and their diastolic collapse, and dilated veins over the anterior thorax may be significant in indicating some interference with venous return.

A means of investigation which may prove to be of considerable help is the electrocardiograph. Dieuade[45] studied a small series of patients in this way. Normally there is a change in the form and amplitude of the electrocardiographic waves on shifting the subject from the right side to the left side. This change is due to a rotation of the heart, and consequently there is a change

in the electrical axis. It is marked in most patients with heart disease, and cardiac enlargement does not prevent the usual change. A small series of patients were shown to have no significant change in their electrocardiographic record with a shift in position. All of these who came to necropsy were found to have important lesions involving both the pericardium and mediastinum. Of a larger series of patients with clinical signs of adherent pericardium, whose records all showed a marked change, none were found to have lesions both of the pericardium and of the mediastinum. It is suggested that fixation of the electrical axis determined by this means may serve as objective evidence of a lesion involving both the pericardial cavity and the mediastinum.

Surgical attempts at freeing the heart so handicapped by adhesions have become more frequent since the advice and communications of DeLorme in 1898 and Brauer in 1902. The procedure advocated by Brauer is the one more frequently employed, rather than the more formidable manipulation of DeLorme, which involved forcible breaking up of adhesions present. In brief the operative procedure consists in removing portions of those ribs to which the pericardium is adherent. As a rule portions of the third, fourth and fifth costal cartilages are removed, with their anterior periosteum, in such a way as to make the chest wall more mobile. Bourne[46] reports twenty-five cases of cardiolysis, and from a consideration of the case histories and results obtained his enthusiasm seems justified. He states that its efficacy in severe heart failure is apparent, and the operation logically should be performed in failure of lesser degree, due to adherent pericardium. The chief indication for the operation is heart failure of whatever degree accompanied by adherent pericardium. The chief contraindication to the operation is the presence of some severe, progressive rheumatic lesion, such as advanced mitral stenosis.

One patient of the present series was subjected to this operation, and the results obtained surely justified the procedure. This patient, a young man of twenty-five, had been under observation over a period of two years, and during several hospital admissions. Acquiescence to the advice for surgical interference was postponed for many months, and the operation was performed only after the patient had been confined to bed with congestive failure for a period of three months, without improvement. Subsequent to the operation the patient was relieved from the substernal distress, dyspnea, and palpitation from which he suffered, and he was then able to be up and about for a period of six months prior to his death from heart failure. We have always regretted that this patient did not submit to operation when he was first advised of its desirability.

CONCLUSIONS

Acute fibrinous pericarditis is not difficult of diagnosis, pericardial friction being its most significant symptom.

Pericardial effusion is not difficult of diagnosis, provided that the patient is followed from day to day with careful physical examination.

The presence of a pericardial effusion does not preclude the hearing of a pericardial friction rub.

Most pericardial effusions caused by rheumatic infection do not require paracentesis.

Adherent pericardium presents greater difficulties of diagnosis and there are no signs which can be considered pathognomonic.

Of the valuable signs, that described by Broadbent is most suggestive, especially when its occurrence is noted on the right side.

As a palliative measure the operation of cardiolysis is of considerable value, and should be recommended more frequently.

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ACCEPTED AND NONACCEPTED VIOSTEROL PREPARATIONS

When the question of accepting preparations of irradiated ergosterol arose, the Council on Pharmacy and Chemistry adopted a common name, viosterol, for this product. This name is not protected by trademark or copyright. It appears to have been generally adopted and is used by all manufacturers whose products have been accepted by the Council, with modifications to indicate composition and strength in vitamin D, as viosterol in oil 100 D and cod liver oil with viosterol 5 D. These products are all required to be physiologically standardized according to the method given in New and Non-official Remedies and may be relied on to have the composition and antirachitic strength claimed on the label. Therapeutic claims other than those permitted by the Council are not made for them. While it is desirable that the short, concise descriptive name viosterol be generally adopted to designate irradiated (activated) ergosterol, there is a danger that it may be used in connection with some preparations in such a way as to give the impression that a product that has not been considered or accepted is one of those accepted for inclusion in New and Non-official Remedies. In order not to waste his time and his patient's money (or worse) by using a product of unknown strength or composition, the physician should make certain that it has been accepted by the Council on Pharmacy and Chemistry. This can be determined by a statement to that effect on the label of the product, by the occurrence on the label or package of the seal which the Council permits manufacturers of accepted products to use, or by direct inquiry to the American Medical Association. (Jour. A. M. A., June 14, 1930, p. 1923.)

TOBACCCO ADVERTISING GONE MAD

The modern tendency for advertisers of all kinds of merchandise to drag the health angle into their advertisements is one of the most disturbing features in the modern advertising field. The medal for the most horrible example would seem to go to the American Tobacco Company in the exploitation of Lucky Strike Cigarets and Cremo Cigars. The exploiters of Lucky Strike Cigarets have claimed that 18,000 physicians have testified that "the heat treatment, or toasting process, applied to tobacco previously aged and cured" is likely to free the cigaret "from irritation to the throat." There was also started a campaign, "Reach for a Lucky instead of a Sweet," in which—either directly or by implication—young women were urged to smoke Lucky Strike Cigarets when they had a desire to cat candy, or pastry. Another branch of the American Tobacco Company's business has been carrying on an advertising campaign for "Cremo" cigars in which the public is led to believe that most cigars are handmade and have their tips finished off with the saliva of the individual workman. Physicians will readily admit that many young women eat more candy than is good for them, but they will certainly not agree that the substitution of cigarets in such cases is in the interest of public health. Physicians may also admit that, theoretically, it is possible for disease to be transmitted by means of cigars. But when one considers the millions of cigars that are consumed annually and that it is extremely difficult to find in medical literature any real evidence of the transmission of pathologic bacteria by means of cigars, the campaign of the Cremo concern stands condemned. (Jour. A. M. A., March 15, 1930, p. 810.)

FIRST INFECTION BY THE TUBERCLE BACILLUS*

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IN THIS discussion, first infection with tuberculosis is considered the entrance of tubercle bacilli into the body in sufficient numbers to produce a positive tuberculin test. *X*-ray evidence may or may not be present. Recovery may ensue or death may follow. Reinfection is considered the entrance of tubercle bacilli into a body that has developed the response shown by a positive tuberculin test.

My purpose is to bring forth the latest opinions as to whether first infection leaves an asset or a liability to the body in our present civilization; whether it protects against progressive tuberculosis or whether susceptibility is increased. In dealing with this question, certain premises must be assumed.

1. For purposes of our study, it must be accepted that the immunity phenomenon in rabbits or guinea pigs is fundamentally the same as in humans. Injection of tubercle bacilli into these experimental animals produces tubercles as in humans and as far as we know the body's method of resisting is comparatively the same. The immune mechanism in the two is the same, but the capacity or power to respond may vary.

2. We must agree that dosage is one of the most important factors in establishing the presence of lesions both in the infected and non-infected body. In comparing, therefore, the difference in resistance of the non-infected and infected organism, we must assume that equal doses of tubercle bacilli are being given.

3. It must be accepted that many first infections as well as reinfections occur without any noticeable symptoms.

In our work with the human family, we are handicapped in this study by the following factors:

1. Our inability to measure the dose of tubercle bacilli entering the body.

2. Lack of knowledge as to the number of inoculations received and their time intervals.

3. Insufficient control over those being observed. Some will observe with great care and diligence the rules of life laid down as to rest, diet and freedom from strain, while others will carry heedlessly on as before, their chief cooperation being to return for further examinations. The tuberculous process will surely behave differently in these two types.

The behavior of first infection and reinfection has been a study ever since the days of Dr. Robert Koch who first reported on the variation in response of animals inoculated with tubercle bacilli the first time and succeeding times. He showed that a given inoculation of virulent tubercle bacilli into a non-infected animal would leave an apparently healed wound until the tenth or fifteenth day when deep ulceration would occur and the wound would discharge until death followed in a few weeks. A similar inoculation into an animal that had recovered four to six weeks before from a sublethal dose, produced within the next two days an indurated area resulting in a superficial ulceration which in turn rapidly healed. The neighboring lymph glands did not become involved in the latter instance. The bacilli were kept localized and were prevented from wide dissemination throughout the body. The body, in other words, resisted the invasion. This peculiar response of a previously infected animal to reinfection was called the Phenomenon of Koch. Later investigators hastened to repeat this experiment, but failed to produce the same phenomenon. Further work showed that their failure was due to too severe initial infections and not giving ample time for the body to develop sufficient immune reactions. It was found that in a too severely infected animal even a small second dose of bacilli would produce a fatal tuberculin intoxication. When this fact became recognized, however, and when proper initial doses were given followed, in the case of the guinea pig, by at least a fifteen day interval before subsequent inoculations, the phenomenon of Koch was then observed. Proper doses and proper time intervals between inoculations, therefore, were found to be necessary for the establishment of a relative state of immunity.

*Presented before the Trudeau Medical Society at Pokegama Sanatorium, June 7, 1930.

This work on the laboratory animal stood without question to be equally true of the human family until recently when the results of tuberculin tests supported by *x*-rays in children attracted such widespread attention. The work of Opie,[1] McPhedren,[1] Myers,[2] Chadwick,[3] Rathbun[4] and many others impressed us with the great prevalence of tuberculous infection in children and showed that first infections, which look so forbidding on the *x*-ray film, in most cases lead to an uneventful recovery. The large pneumonic areas as well as the greatly enlarged lymph glands of the hilum were shown on subsequent examinations to become smaller and smaller and ultimately to clear up leaving nothing but a calcification to attest for past events. The work on childhood tuberculosis during the past few years has proved quite conclusively that the prognosis in first infection by the tubercle bacillus is favorable. The fact also was brought out that of the adult tuberculosis, 50 to 75 per cent had evidence of previous childhood lesions as shown by calcifications. Undoubtedly, still more had evidence that was not found. In fact, 100 per cent must have had a previous first infection, otherwise they would not have developed the adult form of tuberculosis. Now the fact that so many people have been found to have been at one time or another during their early life victims of first infection, the added fact that childhood tuberculosis was shown to be very curable and again that the most frequent cause of death was adult tuberculosis rather than first infection made some people wonder as to the accuracy of our past observations. And may it hurriedly be said that there was sufficient reason for wondering. The facts produced leave no doubt but that the body quite readily overcomes first invasion by the tubercle bacilli. The question that remains, however, is whether the body in its non-infected state is a greater barrier to the development of progressive and fatal tuberculosis than is the already infected body with its allergy. Lack of conclusive evidence in this matter is due to an absence of human experimental animals upon whom equal doses of tubercle bacilli could be given to infected and non-infected persons. This would give us definite first hand information. As it is, we are forced to resort to conclusions based on ordinary laboratory animal experimentation and assume that the same immunity phenomenon is also present in man. There are a number of things which point to the fact that these are fundamentally the same.

1. Initial infection in both man and animal leads to an involvement of neighboring and distant lymph glands. In other words, the tubercle bacilli spread freely through the lymph channels without much apparent resistance.

2. Reinfection in both man and animal is characterized by a lack of lymph gland involvement and a tendency toward localizing the tuberculous process. In chronic pulmonary tuberculosis in the human, this is shown by the frequently observed apical process which tends both to remain localized and to heal with no appreciable enlargement of the hilus lymph nodes. In the animal, it is noted by the observation that a subcutaneous inoculation of tubercle bacilli in an infected animal results in a localized superficial ulceration within a few days time which tends to heal leaving no lymph gland involvement as seen in the first infection case.

3. In both man and animals, a positive tuberculin test is obtainable after first infection.

From what has been said, it appears quite safe to assume that infection phenomena observed in the animal also take place in man. It is most likely that fundamentally they both react the same to the invasion of tubercle bacilli.

Much work has been done since the days of Koch on the results of animal infection by the tubercle bacillus. The contributions of Krause,[5] Baldwin,[6] Gardner,[6] Calmette,[7] and many others have more than confirmed the original observation of Koch that initial infection in animals gives a relative immunity. The recent work of Soper and Dworski[8] in this respect is also very convincing. They studied tuberculous meningitis in the infected and non-infected rabbit. The series consisted of three groups: (1) Animals that had been infected a few weeks previous by virulent tubercle bacilli and recovered; (2) animals inoculated with heat-killed bacilli a few weeks previous; (3) non-infected animals.

After inoculating these three groups with an equal dose of virulent tubercle bacilli into the meninges, he found that the previously non-infected rabbits succumbed to extensive and massive tuberculosis; those vaccinated with heat-killed bacilli lived much longer, but finally died of progressive disease; the rabbits vaccinated with virulent bacilli mostly recovered leaving evidence of healed tuberculosis. His conclusion was

that a previous infection lent a protective influence to the organism.

The work of Rich and McCordock[9] on infection by the tubercle bacillus is most interesting. As opposed to the school which maintains that allergy is a manifestation of immunity, they assert that allergy is a separate and distinct entity and rather than being an aid to immunity is perhaps a detriment to it. Allergy will at times produce severe necrosis which surely is very destructive to tissue and can hardly be considered a benefit to the organism. In support of this view, they cited as examples previously infected animals that have practically lost their allergic response to tuberculin, but whose ability to localize and kill tubercle bacilli at the site of injection is very much in evidence. The immunity mechanism appears to be unimpaired even though the allergic phenomena have practically disappeared. They favor the idea of desensitizing patients with small doses of tuberculin which will lessen allergy, but retain immunity. The work of Rich and McCordock sounds very convincing and it is quite possible that tuberculin therapy may again return for more general usage particularly if this new indication means anything and also when we consider the new tuberculin perfected by Long and Seibert of Chicago.

In an attempt to obtain the latest opinions on this important subject, a personal letter was sent to a number of our outstanding tuberculosis workers asking for their present views on first infection.[10]

Dr. Lawrason Brown answered as follows:

"It seems to me without any question that the first infection renders one less susceptible to active and progressive tuberculosis. Of course, this susceptibility may die out. It is also possible that the first infection may help to localize succeeding infections in the lung rather than permit them to pass through into the glands.

"Have you seen the recent work of Rich in the Johns Hopkins Bulletin? It is most interesting."

Dr. Eugene Opie gave this reply:

"A healed or healing tuberculous infection, I believe, confers immunity but the first infection if sufficiently severe may be a grave danger.

"I am sending a reprint discussing this question."

Dr. Leroy Gardner replied:

"In reply to your letter of April 23rd, I may state that the opinion prevails today that a first infection with the tubercle bacillus confers a condition of hypersensitiveness and of relative immunity upon the tissues of the rest of the body, and that these states persist as long as the primary infection maintains any degree of pathological activity. Therefore, I would say without hesitation that the child who has been infected with a minimal number of tubercle bacilli is in a much better position to cope with subsequent infections than if he had never come into contact with the tubercle bacillus. If you care to go further into the subject, I would suggest that you refer to Colonel Bushnell's book, A Study on the Epidemiology of Tuberculosis, published by William Wood and Company, 1920. Colonel Bushnell went very thoroughly into the subject of tuberculosis developing in the aboriginal races which had never had previous contacts with the tubercle bacillus. In this work you will find references to the literature which should prove helpful to you."

Dr. Edward Baldwin answered:

"I was out of town soon after your letter came so simply sent you one of our 1921 reports as the best answer I could make to your question. Possibly you had read the article of Dr. Gardner and mine before.

"Personally, I never could accept the idea that one infection if it is mild would cause an increased susceptibility to later infection or to an active disease from a later infection. The difficulty is in separating the cases who are latent and active from those that are healed. If the first infection becomes latent but never quite healed, of course we never should confuse those with the kind that leave no after effects. No doubt infections occurring in adolescent ages are more serious because they hang on and develop into progressive disease during early manhood and womanhood. Experimentally we know that mild infections do change the character of subsequent ones, even overwhelmingly bad ones. That is, a secondary infection which may be called super-infection is made a chronic progressive disease rather than acute."

Dr. H. J. Corper replied with this interesting letter:

"I am not surprised that there is considerable discussion regarding the results of first infection by the tubercle bacillus. I might say also that my opinion on this is probably worth as much as every one else's. The reason for this discrepancy of opinion is easily understood when one realizes that probably all of our tests available today are more or less tests of allergy and not of immunity. I think this was very well brought out in Drs. Rich and McCordock's recent article in the Johns Hopkins Bulletin. Of course, we have been text-book bred in the conception of allergy and we are hardly to be blamed for thinking allergy and immunity run parallel. If beliefs, however, are permissible, I should like to dissent with this opinion and point to the fact that allergy is a double-wedged weapon balanced by that unfortunate condition, anergy.

"I believe that there is still much work to be done in the study of immunity in tuberculosis and especially in a segregation of immunity from allergy and this cannot be done unless we enter fully into an understanding of whether the mere inflammatory reaction of allergy is destructive to the tubercle bacilli or merely acts as a diluent and under favorable conditions may not be a good focus for the development of the bacillus unhampered. The solution of these problems must

come eventually when we have a fuller appreciation of the tubercle bacillus as the real disease producer and strike at the problem on a quantitative basis as body cell to tubercle bacilli.

"I am frank to confess my ignorance in elucidating these studies at the present time because they resolve themselves into the use of almost inconceivable numbers of animals and a big organization. I am sure you realize what a big eye-opener Dr. Opie's studies have been concerning that so-called first infection which doesn't exist but is really repeated small infections.

"I might call your attention again to the stumbling block met by Koch in the original use of tuberculin. If this first infection and its expression in allergy were as significant as we thought, would Koch have fallen into the pitfall in his original studies when he advocated tuberculin as a therapeutic agent? Do not think me too critical of this entire consideration when I call your attention to the fact, that at the present time we are almost restricted to the use of mechanical procedures in our treatment of tuberculosis and the Calmette BCG vaccination is still hanging fire, yet what more ideal conditions could there be for demonstrating the significance of first infection than in the newborn infant?

"I am sure you could ramble on just as well as I in pointing out explanations and I can only close by saying that the future holds in store for us some striking surprises in so far as immunity in tuberculosis is concerned."

Dr. Allen K. Krause answered:

"It can easily and definitely be shown by experimentation that a first or preliminary infection of tubercle bacilli materially protects the recipient, that is, any type of animal susceptible to tuberculosis, against successive or secondary infection from without.

"There is every reason to believe that, everything else being equal (which of course it never is), a person exposed to tuberculous infection and receiving enough infection to be sensitized yet not showing active and progressive infection, is better able to cope with our present civilization, so far as tuberculous infection is concerned, than a person who has never been exposed to tuberculous infection."

Dr. Calmette of the Pasteur Institute replied as follows:

"Here is my answer to the question you have asked me. It is certain that a light primary infection not followed in a short time by a reinfection gives immunity. But if the primary infection is severe and followed by repeated reinfections, the primary infection becomes sensitive rather than protective.

"The necessity of a light infection (and moreover it must be as guarded as possible in case of the young child) is so evident in permitting the organism to resist outside infections that we definitely consider that in BCG vaccination with a living but avirulent bacillus and sufficiently attenuated to constitute an effective vaccine.

"The phenomenon of Koch concerns resistance of the organism relating to first infections and it is observed only in subjects whose primary infection is recent or when the primary infection has indicated a developing tuberculosis.

"I have explained all that in my book on the preventive vaccination of tuberculosis published by the Messon Publishing House, 120 Boulevard Street, Germain, Paris, VI, in 1928."

The determining factors involved in producing progressive and fatal disease or recovery appear to be the number of tubercle bacilli to the dose and the resistance of the host. The greater the dose, the more unfavorable the outcome. The resistance desired, if we are to accept the opinion of Rich and McCordock, is to have much immunity with little allergy: in other words, we want the immune forces to destroy the bacilli or localize their activities with as little local or general disturbance as possible. From the experimental work so far done it seems that this is best accomplished by a light primary infection and allowing a number of weeks time interval before being subjected to a reinfection. We realize of course that the perfect state would be eternal freedom from the tubercle bacillus, a non-infected body with no possibility of infection, but in our present civilization when at most any time we may be precipitated into a hot-bed of tuberculosis it does seem that a body fortified by a light infection stands the best chances of survival.

This opinion is further strengthened by the work of Dr. Lurie, at the Henry Phipps Institute,[11] which showed the fate of the tubercle bacillus in various organs of the body in both the infected and non-infected animal. The organs considered were the spleen, liver, lung, bone marrow and kidney. Dr. Lurie demonstrated that tubercle bacilli injected intravenously into non-infected rabbits were deposited in greatest number in the spleen, then in the liver, lungs, bone marrow and kidneys in the order given. They multiplied until the second to the fourth week when destruction of the tubercle bacilli by the body manifested itself. Destruction of the bacilli occurred in the spleen, liver and bone marrow, but they multiplied in the lungs and kidney until death. If and when recovery was the result, destruction of the bacilli also then took place in the lungs and kidney as well as the other organs beginning the second to fourth week. In the previously infected animal, the bacilli inoculated began to be destroyed immediately without preliminary multiplication.

The question naturally arises whether vaccination by attenuated tubercle bacilli such as Calmette recommends is a wise procedure. It is not well to dismiss this idea without careful thought. Workers such as doctors and nurses in particular who expose themselves to the hazards of tuberculous infection at some time or other in their lives involuntarily become vaccinated by the patients they serve. The tuberculin test becomes positive. Tubercle bacilli have gained entrance to the body in what numbers they know not. It might well be discussed whether the doctor or nurse who enters into a known source of infection should be vaccinated by the Calmette method or by the patient to doctor or nurse method. Whatever method is used it seems imperative that the possibility of a reinfection for a number of weeks should be guarded against. And so the doctor or nurse who in the course of treating the tuberculous patient develops a positive tuberculin test would perhaps be best safeguarded by a change of environment for a few weeks or months with plenty of rest, proper food and stimulating air and sunshine. As a substitute for the old adage, "Physician, know thyself," it might be well to say, "Physician, know thy vaccination."

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ETHYLHYDROCUPREINE

Clinicians of large experience have grown skeptical about the use of ethylhydrocupreine (optochin) in the treatment of pneumonia, whereas they were once enthusiastic, and hopeful about its possibilities. In a review of this subject, Cahn-Bronner cites an extensive literature and concludes from his own experience and a review of numerous authors that ethylhydrocupreine is not superior to quinine and that neither drug is a specific in the treatment of pneumococcus pneumonia. The following with reference to ethylhydrocupreine appears in New and Non-official Remedies: "Clinical investigation indicates that the drug may be of value in the treatment of lobar pneumonia, if a sufficient amount can be administered sufficiently early without untoward effect. To avoid such effect it is proposed to secure low absorption through the administration of the free base by mouth. The hydrochloride may be administered intramuscularly, but is liable to be irritant. Intravenous administration seems to be contraindicated. The drug has a definite value in the treatment of pneumococcic infections of the eye (ulcus corneal serpens)." (Jour. A. M. A., March 22, 1930, p. 888.)

NO INTESTINAL ANTISEPTIC

There is really no such thing as an intestinal antiseptic, if that term is defined as equivalent to disinfectant, there being no known influence capable of killing the micro-organisms in the living intestine. If the term is defined to include inhibition of the growth and diminution in the number of intestinal microbes, then diet (milk diet in most adults) constitute perhaps the most important influence of that kind. Mild mercurous chloride might qualify as an efficient drug with a tendency in this direction. Phenolsulphonates (sulphocarbolates) are worthless. (Jour. A. M. A., June 14, 1930, p. 1939.)

POSSIBLE DEATH FROM DRINKING ETHYLENE CLYCOL ("PRESTONE")

A death is ascribed to drinking Prestone. Prestone is ethylene glycol. It is an excellent antifreeze agent for automobile radiators but a questionable beverage. Ethylene glycol has been introduced as a nontoxic substitute for benzene in lacquers and paints. There is no record of untoward effects from its proper use. Taken as a beverage, intoxication and death are reasonable expectations. (Jour. A. M. A., June 14, 1930, p. 1940.)

EVULSION OF THE PHRENIC NERVE FOR PULMONARY TUBERCULOSIS*

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THE *sine qua non* in the treatment of pulmonary tuberculosis is, and until a specific remedy is found, will be, rest. It is so fundamental and withal so simple, so much so that not infrequently it becomes difficult to apply, that it seems pertinent from time to time to refresh our minds regarding its basic importance. And likewise it appears wise to accept and apply any measure or combination of measures which will insure more complete cessation of lung activity and to report and discuss concerning their virtues and deficiencies.

Artificial pneumothorax has found without question its rightful premier place in the accepted present day armamentarium for treating progressive unilateral tuberculosis of the lungs and in recurrent or ungovernable hemorrhage cases. Extrapleural thoracoplasty is as firmly established, particularly in handling the chronic excavated one-sided lesion, where pneumothorax has failed. These two measures have been used so univerally and over such a length of time that their therapeutic value is quite fixed and at a very high level.

Interruption of the function of the phrenic nerve is the third procedure which definitely affords pulmonary relaxation and compression and therefore more complete rest.

Simple section of the phrenic nerve, so-called phrenicotomy, was first suggested and used by Stuertz[1] in 1911. He recommended it chiefly for predominantly unilateral basal tuberculosis where pneumothorax was prevented by adhesions. Sauerbruch[2] in 1913 working quite independently of Stuertz reported five cases where phrenicotomy had been beneficial, noting particularly that no disturbance of heart action or respiration ensued. He also felt in combination with penumothorax that the possibility of effusion was diminished. Schepelmann[3] in 1913 suggested phrenicotomy for early lung tuberculosis. Some years elapsed with very little being done with phrenic nerve operations until 1921 when Goetze[4] and Felix[5] found that about 25 per cent of diaphragms were not immobile following simple sectioning of the nerve and attributed this failure to the presence of accessory fibers entering the main trunk line below the point of section. Each of them proposed a radical phrenicotomy to insure complete and permanent diaphragmatic paresis. Felix called his operation "phrenico-exairesis" and claimed that it resulted in a "marked curtailment of the respiratory activity of hemi-thorax and a diminution of the capacity of that side of the chest, causing a relaxation of the lung." Felix's operation is the one commonly used in this country today and consists practically of a complete evulsion of the nerve.

Since 1921 a rather voluminous literature on phrenicectomy has been produced with markedly varying opinions. H. Alexander[6] in 1922 felt that the chief benefit from radical phrenicectomy was on basal lesions though he noted that upper lobes were benefited also; he thought that the operation was indicated before every thoracoplasty and in testing the contralateral lung. O. Goetze[7] in 1922 felt that "every pneumothorax except that which gives extremely satisfactory results from the very beginning should be combined with a radical phrenicotomy." Frisch[8] in 1922 thought that phrenicectomy was useful in pneumothorax cases with adhesions and cited instances where hemoptysis was controlled by the combination where pneumothorax alone failed. Sauerbruch[9] in 1923 injected a more pessimistic note and warned that the hope which many expressed for phrenicectomy for healing progressive tuberculosis had not been realized. He noted that many were improved but none healed by the procedure and felt that it was of value primarily as an adjunct. Other continental workers agreed with this view such as Rolland, Maurer and Volter[10] (1924), who concluded that immediate results were good but final not so good. Lehmann[11] in 1924 felt that the value of phrenicectomy depended on its combination with pneumothorax or thoracoplasty and held the opinion that exudative lesions do not respond well. Hauke[12] in 1924

*Presented before the Minnesota Academy of Medicine, Saint Paul, October 9, 1929.

noted that the part played by the diaphragm in respiratory widening of the thorax is not significant and that artificial paralysis of the diaphragm did not cause disturbance of respiration or circulation and that it did favor expectoration rather than inhibit in. He reported two failures in twenty-four cases. Laudgrof[13] in 1924 thought that phrenicectomy was indicated in: (1) severe pulmonary tuberculosis where one side was so advanced that pneumothorax or thoracoplasty was not permissible; (2) in bilateral disease not too extensive; and (3) in apical lesions when progressive but not pneumonic. He had had two persons with lower lobe tuberculosis who lost their sputum and bacilli following phrenicectomy. J. Alexander[14] in 1924 made a plea for radical phrenicotomy in the treatment of early pulmonary tuberculosis arguing that "the decidedly favorable influence of the pulmonary rest and relaxation caused by complete paralysis of a hemidiaphragm in advanced tuberculosis strongly supports the suggestion that radical phrenicotomy in conjunction with the usual careful hygienic regime, would offer patients with predominantly unilateral early tuberculosis, who are not making satisfactory progress under the hygienic regime alone, a greater chance of early and permanent clinical cure than any other known method of treatment." As far as I can determine, this suggestion of Alexander has never had a thorough trial though it has distinct merit. Gravesen[15] in 1925 in his monograph on the surgical treatment of pulmonary tuberculosis devoted but little space to phrenicectomy and said it should as a rule be used in conjunction with pneumothorax and thoracoplasty; that more rarely it alone may be of benefit. Lilienthal[16] in 1925 stated that phrenicectomy is often of great therapeutic value in pulmonary tuberculosis and other disorders. At that time he apparently had had a very small experience with the procedure. He mentioned its use for diaphragmatic pleuritic pain. Alexander[17] in his "Surgery of Pulmonary Tuberculosis" (1925) devoted a very satisfactory chapter to phrenicectomy. His indications for its use were when used independently: (1) In acute tuberculosis where the pleura is adherent and thoracoplasty contraindicated; (2) in chronic disease with adherent pleura and with poor general condition and other lung not good; (3) in moderately or far advanced cases where pneumothorax or thoracoplasty are not contraindicated

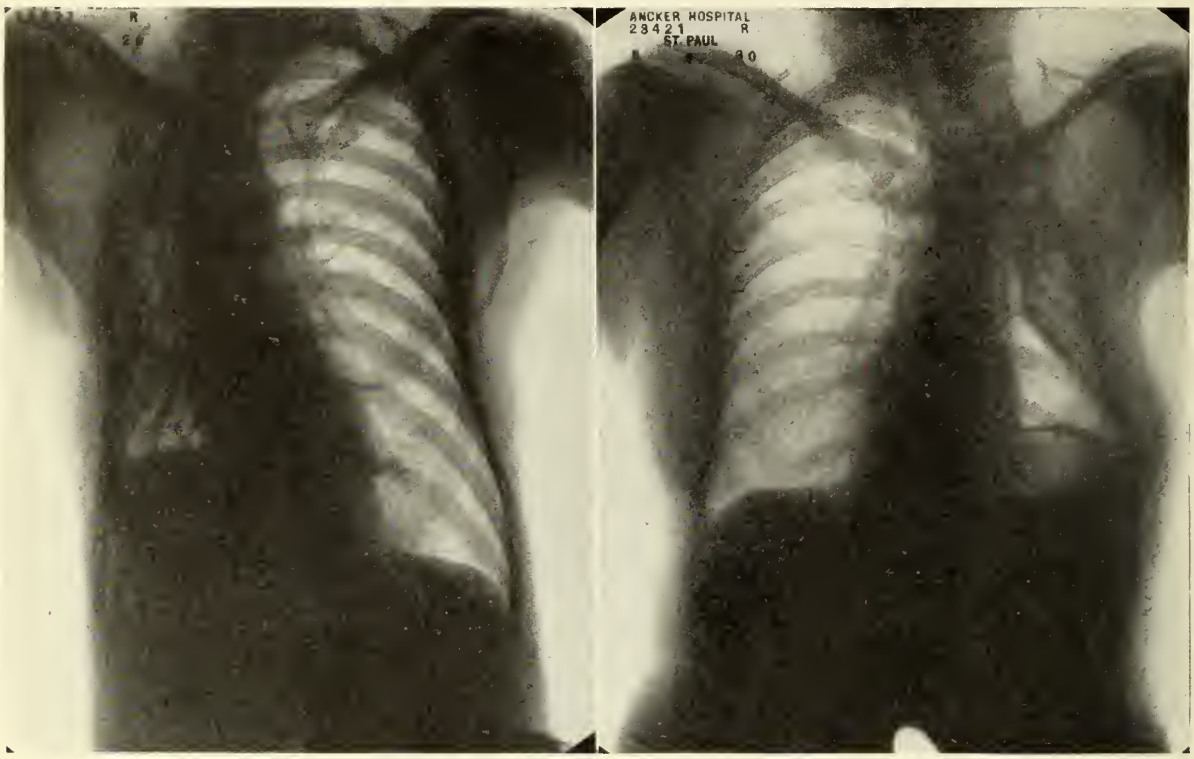


Fig. 1. Phrenic nerve evulsion with complete and upper rib thoracoplasty.

and where it might get away from pneumothorax refills or the hazards of thoracoplasty; (4) for early cases which do not show sufficient improvement with the usual sanatorium regime. As an adjunct to pneumothorax he recommended its use: (1) when partial or total pneumothorax was not producing satisfactory results; (2) supplementary to satisfactory pneumothorax in order to cut down the frequency of refills, to help reduce the incidence of effusions and to reduce the degree of expansion. He further stated that it is rapidly gaining favor as an operation to be performed before every thoracoplasty. Alexander did not mention its use for unilateral basal lesions and stressed the virtue of phrenicectomy as an adjunct remedy rather than use alone and urged no waiting period after but more surgery such as thoracoplasty at once. Bacmeister[18] in 1926 reported eighty cases in which phrenicectomy was used and concluded it was suitable and valuable as an adjunct. Moreau and Olbrecht[19] in 1926 held the opinion that the ideal theoretical indication was in a lesion limited to one base and thought in this instance phrenicectomy was preferable to pneumothorax. Berard, Guilleminet and Desjacques[20] in 1927, after reviewing results in fifty-one cases, concluded that pneumothorax and thoracoplasty remain the great means of pulmonary collapse and that phrenicectomy is a supplementary resource not to be underestimated or neglected. Wolf and Lossen[21] in 1927 noted obliteration of a cavity after phrenicectomy. Geer[22] in 1927 advocated its use preliminary to thoracoplasty and cited four cases of basal lesions which had been improved markedly following phrenicectomy. Matson[23] in 1927 noted improvement in upper lobe cavities following phrenicectomy and urged its routine use preliminary to every thoracoplasty. He also felt it was of value in conjunction with partial pneumothoraces, and because of its simplicity and great value thought that phrenicectomy must be considered next after pneumothorax and before other radical procedures. He stated "as a simple procedure in selected cases and as a supporting operation we are convinced of the value of phrenicectomy." Davies[24] in 1928 said that phrenicectomy was a great help in handling basal lesions and that it always should be done in long standing pneumothorax cases before expansion. Lord[25] in 1928 stated that phrenicectomy "still holds a place among measures designed to assist in putting a tuberculous lung at rest, but that it is of relatively little value as an independent procedure but

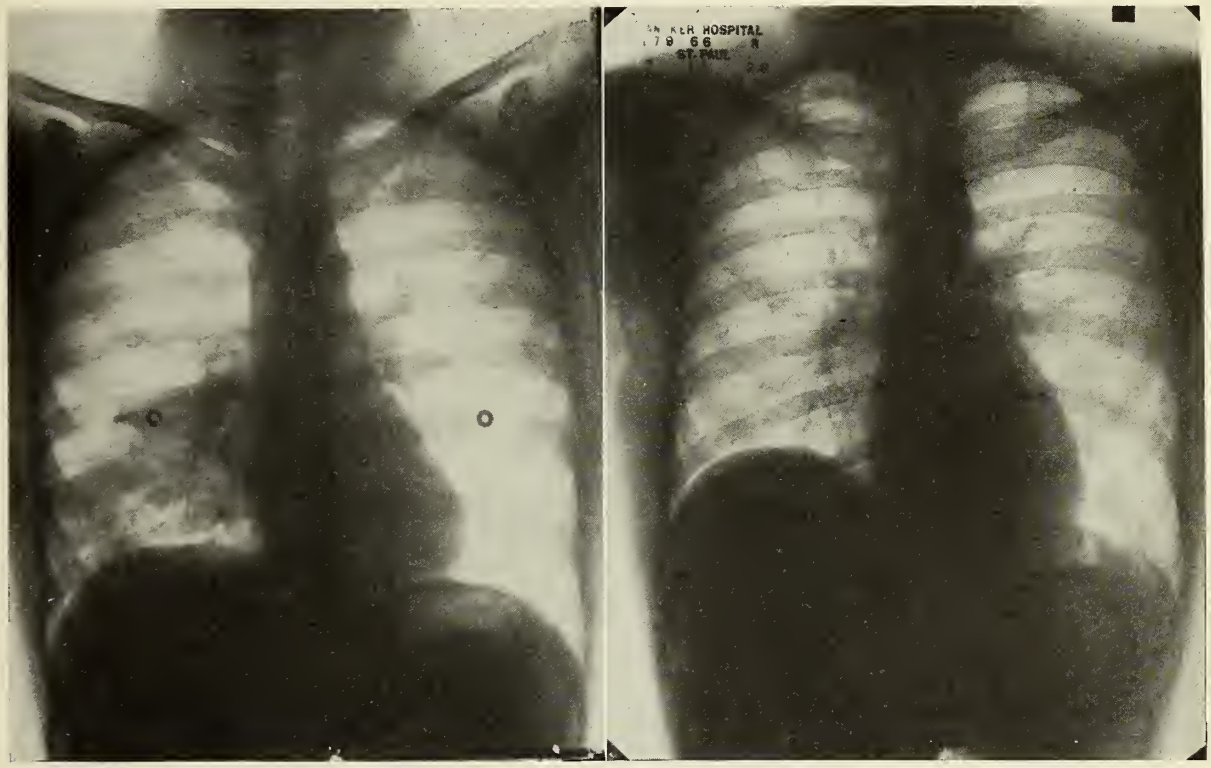


Fig. 2. Phrenic nerve evulsion for lower lobe tuberculosis. Note resolution of right lower lobe lesion after phrenicectomy.

it may serve to estimate the capacity of the opposite lung when that is uncertain or as a preliminary to a more radical operation and that it is to be regarded as of limited therapeutic and fect upon upper as upon lower lobe lesions and that it was of no help as an adjunct to pneumothorax.

The anatomy of the phrenic nerve is worthy of

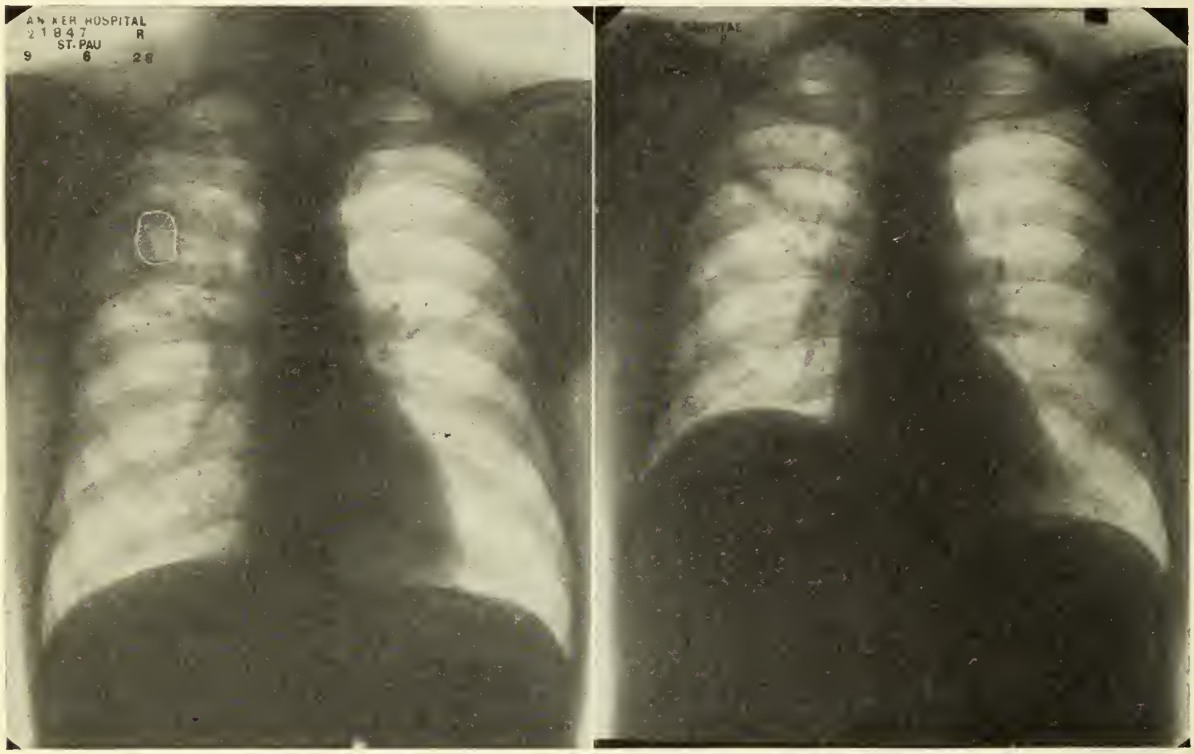


Fig. 3. Phrenic nerve evulsion for upper lobe cavity. Note obliteration of right upper lobe cavity after phrenicectomy.

diagnostic value when used alone." Mayer and Leitch[26] in 1929 report cases in which upper lobe cavities of over three centimeters in diameter closed following phrenicectomy. They noted that at times a diaphragm apparently adherent fluoroscopically will rise after phrenicectomy. Loewenthal[27] in 1929 reported five cases in which pneumonia developed after phrenicectomy and thought this was due to lack of proper aeration due to immobility of the lung. Holmboe[28] in 1929 on the other hand thought phrenicectomy should be given a trial because it is free from danger and in many cases undoubtedly gives good results. Matson[33] contended in 1929 that evulsion of the phrenic nerve was indicated as an independent procedure in those cases wherein a thoracoplasty is impossible and as a preliminary to every thoracoplasty. Wells[34] in discussing the results of three hundred phrenicectomies in 1929 felt that it is valuable in a wide variety of pulmonary tuberculosis cases. He found it had as much ef-

brief review. It takes origin from the third, fourth and fifth cervical roots, with occasional fibers from the seventh and eighth cervical and first thoracic. Its main trunk is in association with a small ascending cervical artery for a short distance and runs beneath the sternocleidomastoid muscle downward and inward across the anterior surface of the scalenus anticus muscle, thence beneath the subclavian vein into the thorax along the external surface of the pericardium to the diaphragm. Goetze could demonstrate no anastomosis between the right and left phrenic nerves. Felix could not show any connection between the vagus and phrenic nerves. In about 25 per cent of people there is an accessory phrenic nerve arising from the fifth cervical, sometimes according to Felix from the third, fourth or sixth. The phrenic nerve according to Felix supplies the entire motor innervation of the diaphragm except for a few fibers that arise from the twelfth intercostal nerves. Lemon[29] concluded that if the dia-

phragm receives any innervation from the intercostal nerves their usefulness is so small that it is inadequate to prevent atrophy or to permit of contraction when the nerve is stimulated. Matson[30] in dissecting out one hundred and twelve phrenic nerves on cadavers found only 72 per cent typically situated. He found double phrenics with associated fibers on the face of the scalenus anticus eight times. In four instances associate phrenics came from the subclavian nerve. Once he found a bilateral and once a unilateral absence of the typical phrenic nerve, there being no main trunk on the anterior surface of the scalenus anticus, but two large trunks coming mostly from the fifth cervical close to the point of origin of the subclavian nerve. All three of these passed down in front of the subclavian vein and came off so far lateralwards that they could not be located by the customary incision. In twenty-three instances the accessory phrenic fibers came in common with the subclavian nerve from the fifth cervical root. Six times the accessory nerve was apart from the subclavian nerve as a separate branch. In five other instances it formed a loop around the vein. Once two associate phrenic trunks passed in front of the subclavian vein, then looped around behind the internal mammary artery. In one instance he found the associate phrenic passing through the wall of the subclavian vein. Because of these anatomical variations, Matson felt that the Felix type of radical phrenicotomy is not without danger.

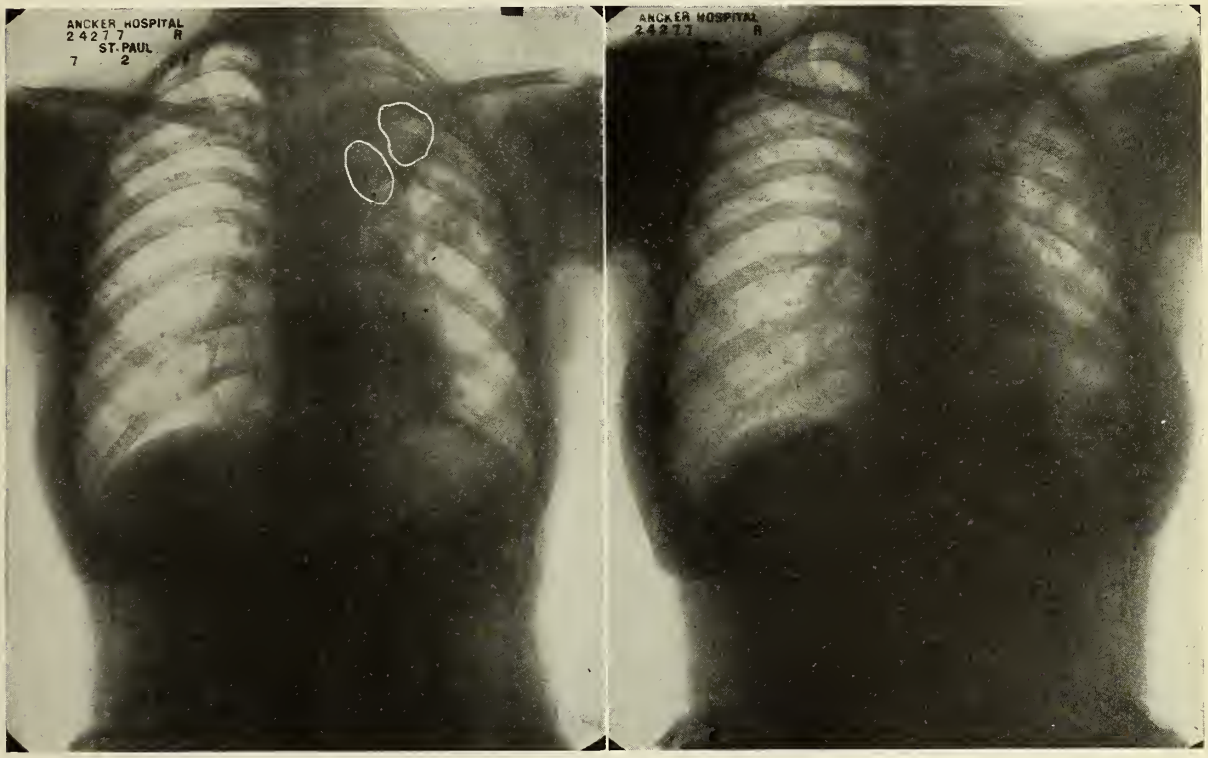


Fig. 4. Phrenic nerve evulsion for upper lobe cavitation. Note closure of two cavities in left upper lobe after phrenicectomy.

The effect of a unilateral phrenicectomy in a person with a non-adherent diaphragm is a complete paralysis and a passive rise of the hemidiaphragm into the chest to a full expiratory position. Several months may elapse before it attains its ultimate position. It may not be completely immobile due to tugging of the central tendon by the normally active side or to the so-called paradoxical movement effected by intra-abdominal pressure. The reduction of lung volume by phrenicectomy varies between 25 and 35 per cent. The pulmonary relaxation subsequent to phrenicectomy and the reduction in lung volume affords a certain amount of rest though the elimination of the pumping or piston-like action of the diaphragm is the most important single factor resulting from the operation. This affects chiefly the lower but also the upper lobes. Brunner[31] found a right lung of 2400 c.c. volume reduced 600 to 900 c.c. by thoracoplasty and that it was

reduced 400 to 800 c.c. by phrenicectomy. He further noted that cough and expectoration were easier after phrenicectomy. In other words, the anatomical and physiological effects of phrenic nerve interruption are similar to thoracoplasty though less marked.

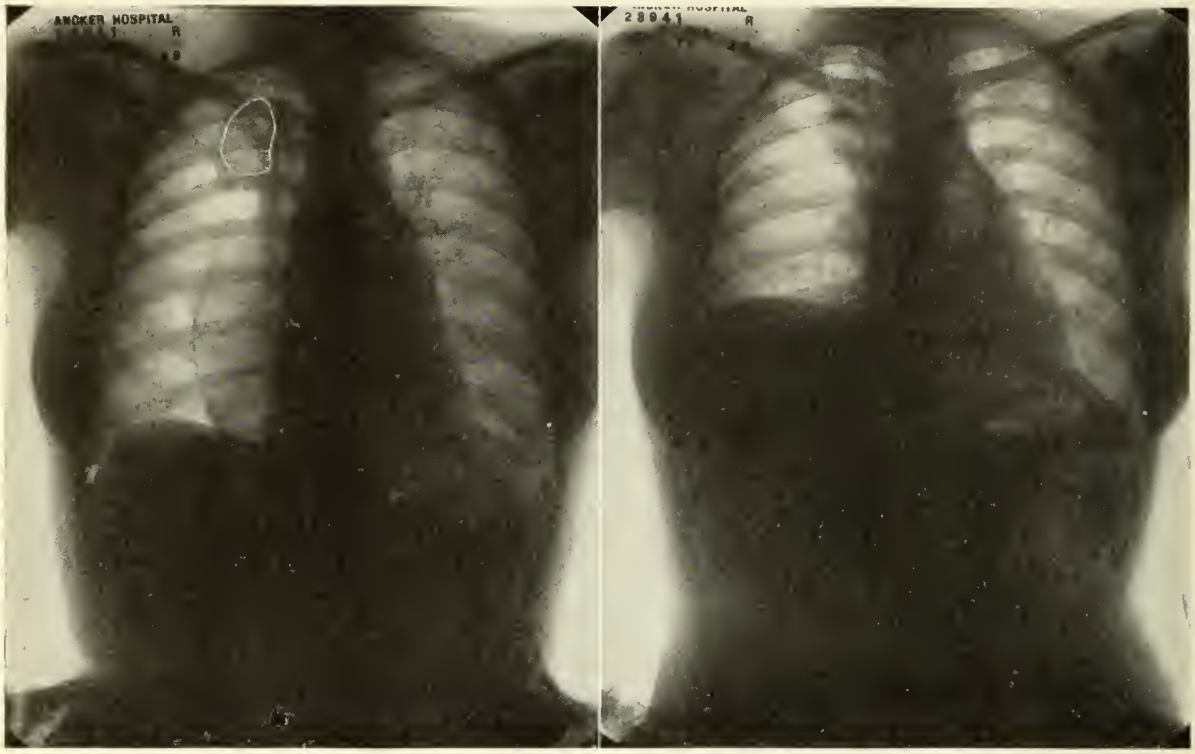


Fig. 5. Phrenic nerve evulsion adjunct to pneumothorax. Cavity held open by adhesions which closed after phrenicectomy.

Lemon[29] observed experimentally that section of one phrenic nerve caused paralysis and atrophy of the entire hemi-diaphragm on the same side and that after five months there was no evidence of cross innervation or regeneration. He further felt after observing the effects of both unilateral and bilateral phrenic neurectomy in dogs that perhaps the functional importance of the diaphragm had been overestimated.

It is obvious that the height to which the diaphragm rises after phrenicectomy and the beneficial results obtained are closely related. This factor is one which cannot be foretold and one which will be fully known only after several months have elapsed. Alexander found the average elevation of the paralyzed diaphragm in twenty cases, including right and left, to be 7 cm. at the end of inspiration and 3 cm. at the end of expiration. Most authors have found that the right diaphragm rises higher than the left but my experience has been the reverse.

I know of no case where bilateral phrenic nerve evulsion has been done for pulmonary tuberculosis. Sauerbruch has performed the operation for persistent singultus on both sides with only temporary dyspnea; Wells has done the same thing. Lemon has done it experimentally on dogs with no apparent ill effect. In one of my cases, that of a woman with a basal lesion, the diaphragm on the opposite side was completely immobile because of adhesions. Following phrenicectomy she was quite comfortable with two fixed diaphragms and now, three years after, is alive and well.

My experience in using phrenic nerve evulsion in the treatment of pulmonary tuberculosis is limited to ninety-three cases from the Pokegama Sanatorium and the Ancker Hospital Tuberculosis Pavilion. Twenty-eight were in combination with extrapleural thoracoplasty, fifteen of these with the complete thoracoplasty operation, and thirteen in combination with resection of the upper five to eight ribs. It is difficult to correctly evaluate the value of phrenicectomy

used in this manner. To me it seems the logical procedure and I unhesitatingly urge the operation preliminary to every thoracoplasty for the reason that the capacity of the lung to be operated upon is reduced thereby from 400 to 800 c.c. This, of course, gives more lung relaxation and therefore more effective compression and more rest. Furthermore our experience[32] in studying unsuccessful thoracoplasty cases with the aid of iodized oil has shown that a certain percentage of chronic fibroid lungs have varying degrees of bronchiectasis which calls for the most complete collapse possible in order to check cough and sputum.

Forty-five of my series were done on persons with upper lobe cavities in whom there was such a definite tendency for the cavities to close after phrenic neurectomy that thoracoplasty was withheld to see what would happen eventually. Twelve of these achieved complete obliteration of their cavities with resultant loss of bacillary sputum. Two others apparently did the same thing within two months, only to have symptoms later with reopening of the cavities. Fifteen have been done too recently to judge results but at this time do not look encouraging. One with an unusually large cavity was allowed to go eight months because of the extraordinary reduction in the size of the cavity but finally was submitted to an upper lobe thoracoplasty with success.

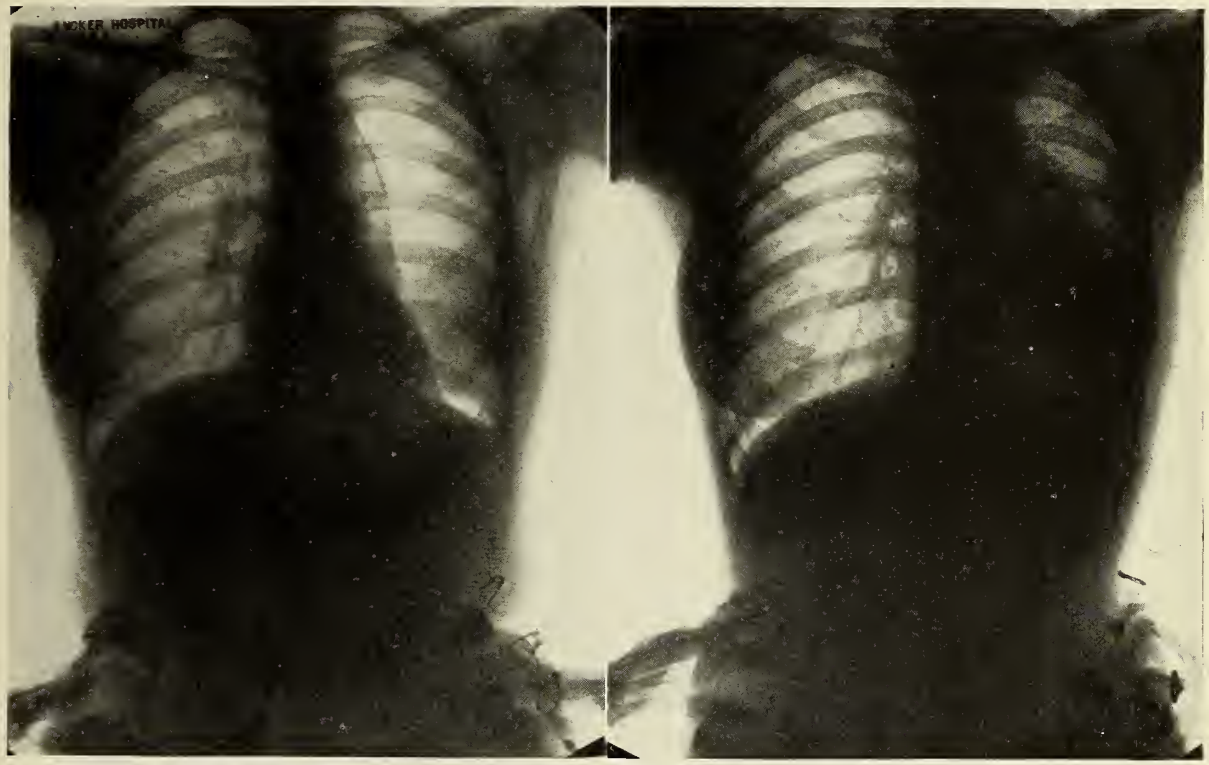


Fig. 6.—Phrenic nerve evulsion with expansion after pneumothorax for five years. Note reduction capacity of left hemithorax rendering complete expansion impossible.

Ten patients with unilateral basal lesions have submitted to phrenic nerve evulsion. Five are clinically well. One died of generalized tuberculosis. Another has been done so recently as to be uncertain as to its outcome. One other had a normally moving diaphragm following the operation but did well with eighteen months' bed rest. Thoracoplasty and pneumothorax were necessary in the other two cases.

Thirteen phrenicectomies have been done in conjunction with pneumothorax. One of these had an upper lobe cavity held open by adhesions; with phrenicectomy sufficient additional relaxation was afforded so as to obliterate the cavity. Three have been done preparatory to permitting the lung to expand. One of these was an original upper lobe lesion with a bronchogenic spread into the lower lobe on the same side. A perfect result was obtained with pneumothorax and on allowing the lung to partially expand it was noted that the upper lobe was quite clear and expansile, but that the lower lobe was ap-

parently non-expansile. After phrenicectomy the upper lobe expanded completely, filling the thoracic space but leaving the lower lobe collapsed. The fifth pneumothorax case was one of lower lobe cavitation incompletely closed by air and which did close following phrenicectomy. The sixth was done because of premature expansion caused by an obliterating pleuritis subsequent to an effusion. In this case phrenicectomy was not successful in preventing reopening of upper lobe cavities and the patient has undergone an extrapleural thoracoplasty. Seven others had upper lobe cavities held open by adhesions and were uninfluenced by phrenicectomy.

One case was that done in a patient with a five centimeter cavity close to the left root and in whom a dense shadow behind the heart suggested bronchiectasis. An intratracheal iodized oil injection proved a lower lobe bronchiectasis and phrenicectomy was done hoping the bronchiectasis would be benefited. Her cavity and bronchiectasis continued on their way unaffected. In one instance phrenic nerve evulsion was done for a fulminating lesion where pneumothorax could not be induced because of adhesions and thoracoplasty was contraindicated; death ensued despite the phrenicectomy.

Six patients in this series of ninety-three continued to have normal diaphragmatic movement following the operation. In two of these no nerve could be found which, when stimulated, caused diaphragmatic contraction. Two probably had deep accessory fibers. Second operations in the other two were successful in finding and evulsing the nerve.

To summarize: I feel that phrenic nerve evulsion should precede every thoracoplasty operation for pulmonary tuberculosis, as it does afford increased pulmonary relaxation. Some workers feel that aspiration episodes are more likely to follow if phrenicectomy is done first but I have yet to see it happen. And, furthermore, it certainly is true that the nerve can be found more readily before thoracoplasty than after because apparently the dropping of the first rib alters the cervical anatomy. I am convinced that phrenicectomy alone in a high percentage of one-sided basal lesions holds out opportunity for an excellent clinical result and believe that it warrants primary trial here unless the lesion is a fulminating one, in which case pneumothorax is the treatment of choice. It is also quite apparent that a certain number of upper lobe cavities will close with phrenicectomy and I, therefore, disagree with Alexander, Sauerbruch, and others who feel that all phrenicectomies should be immediately followed by thoracoplasty. A few months' waiting period unquestionably will save from 20 to 30 per cent of these people further operative interference. Its use in conjunction with pneumothorax is rational, especially when used preliminary to re-expansion. Furthermore, it seems wise to employ it in those pneumothorax cases where adhesions are preventing a satisfactory collapse before resorting to more radical measures such as pneumolysis, opened or closed, or thoracoplasty, although in this field it apparently is the least helpful.

In conclusion I would state that:

1. Phrenic nerve evulsion is the third most valuable means we have for effecting more complete lung rest than bed rest alone affords.
2. It should be employed preliminary to every extrapleural thoracoplasty done for pulmonary tuberculosis irrespective of diaphragmatic adhesions.
3. It is particularly efficacious alone when used for unilateral lower lobe tuberculosis.
4. It will succeed in obliterating a certain number of upper lobe cavities.
5. It can be used to advantage in combination with pneumothorax especially in cases with adhesions and prior to re-expansion.
6. It is well to emphasize that phrenic nerve evulsion is no overnight cure for pulmonary tuberculosis, nor anything remotely approaching it. A carefully supervised sanatorium regimen is just as important with as without the operation and this point cannot be overstressed.

NOTE: My grateful appreciation is due Drs. A. R. Colvin, L. E. Daugherty, D. G. Gardiner and E. M. Jones, who have done the operating on the above cited cases and who at all times exhibited an indispensable spirit of coöperation.

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THE CUTANEOUS ABSORPTION OF MERCURY

It requires little imagination to appreciate the uncertainties that must attend the problem of dosage when such a relatively insoluble substance as mercury is applied to the skin. The size of the particles, the nature of the adjuvant, the place of application and its conditions, and the vigor with which inunction is practiced are some of the complicating features. The assumption that only the mercury globules rubbed into the follicles are gradually absorbed had led to the clean inunction method proposed by Cole and his collaborators. Some indication of the efficacy of inunction procedures can be secured by estimation of the substance that is eliminated. This has been done and it was found that the amount of mercury which is absorbed and excreted after inunction is dependent directly on the concentration of the metal in the base—that is, 5, 25 and 50 per cent preparations show that the excretion is about in proportion to the concentration in the ointment used. Again, contrary to what many have assumed, colloidal mercury ointments showed no greater excretion of mercury than official old fashioned mercury ointments of equal concentration in benzoinated lard. Furthermore, massive or intensive weekly inunctions of a 30 per cent mercurial ointment may lead to an equal or higher mercury excretion than the simple daily use of 50 per cent ointment or even certain types of intramuscular injection. (Jour. A. M. A., April 26, 1930, p. 1322.)

PRESIDENT HOOVER SIGNS BILL CREATING NATIONAL INSTITUTE OF HEALTH

Recently President Hoover signed a bill sponsored by Senator Ransdell of Louisiana, which provides that the Hygienic Laboratory of the United States Public Health Service shall become the national institute of health.

In a recent radio broadcast, an authorized summary of which was published in the *United States Daily*, Senator Ransdell stated:

"The most important feature of the bill is the provision for fellowships, which would be in the nature of chairs, as those chairs are founded in institutions. The most valuable asset of the people of the country is brains. There are young men who, by reason of lack of finances and lack of encouragement, and the inaccessibility of a scientific environment in which to develop, have fallen by the wayside.

"The purpose of a measure of this kind is to have potentially available a provision whereby a young man could be aided, not for a few days or a few weeks to finish his education, but to aid him after he has graduated, providing he is an extraordinary student. I contemplate that nobody but outstanding students will receive consideration under this act, and their first duties would be to come to the national institute of health and receive their training and stimulus, and then be subject to detail wherever health problems might be desired to be taken up."

—*Health News*, June 30, 1930.

THE TREATMENT OF BOILS AND CARBUNCLES BY ROENTGEN RAYS*

EUGENE T. LEDDY, M.D., and S. ARCHIBALD MORTON, M.D.
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A CARBUNCLE may be regarded as an aggregation of boils and may be a much more serious condition than a boil. The same methods of treatment are used for both.

The usual methods of treatment are hot poultices, incision, local application of ointments and lotions, administration of drugs internally, and vaccines. Those methods of which the purpose is abortion of the process are often not effective; the abscess continues to form, and later breaks down or is incised, leaving a discharging wound that takes a varying length of time to heal. The infective discharges are likely to cause similar lesions nearby.

Hot poultices are to be condemned because of their aptitude for spreading the infection to adjacent hair follicles. Although they frequently relieve the pain, the patient must curtail his activities more or less while they are being used. Incision is often necessary, but it is to be avoided whenever possible as it makes a discharging sore which may heal slowly, leaving an ugly scar. Ointments and lotions are messy and seldom of much value in aborting the disease. Drugs given by mouth, particularly the preparations of sulphur and tin, are recommended by some, but opinions as to their value vary. The vaccines used are either of the stock or autogenous variety. They are useful only in cases of recurring boils, and the autogenous variety has the further disadvantage that it takes some days to prepare it. The vaccine treatment, to be of value, must be given over a period of several weeks or months and, in addition, is expensive.

In spite of the fact that roentgen rays have been used successfully in the treatment of boils and carbuncles for more than twenty years, the value of the method apparently is not appreciated by most physicians. We believe that the treatment of these lesions by roentgen rays, although not always efficacious, is superior to the methods generally used.

When the process is in the indurated state, before it has "come to a head" and before it is discharging, treatment by roentgen rays causes rapid regression in about half of the cases and considerable relief in the remainder. When a core has formed, or when the sore is discharging, not as much can be expected from treatment. However, in most cases, besides shortening of the duration of the disease, definite analgesia is brought about, which is much appreciated by the patient. If the patient is having successive boils in a given region, roentgen rays will prevent infection of other follicles. We have never seen a new boil develop inside the field irradiated.

TABLE 1

COMPARISON OF RESULTS IN EARLY AND LATE TREATMENT OF BOILS AND CARBUNCLES BY ROENTGEN RAYS

Result	Treated in less than three days from onset, 44 cases	Treated in more than three days from onset, 56 cases
Analgesia	43	50
Abortion	28	....
Prompt improvement	10	8
Slow improvement	2	42
Failure	4	6

In order to evaluate the treatment, we reviewed the histories of 100 cases in which we knew the outcome of the disease. These comprised seventy-four cases of boils and twenty-six cases of carbuncles. For the roentgenologic treatment to be of maximal value, it should be given early in the course of the disease (Table 1). We considered that we had aborted the lesion when it disappeared in two days or less, and that the treatment was a failure if the extent and duration of the process were not appreciably shortened, even though considerable analgesia might have been obtained.

When the lesions were treated early, they were in the stage of induration. Comparison of the results on the basis of whether induration or

*From the Section on Therapeutic Radiology, The Mayo Clinic, Rochester, Minnesota. Submitted for publication June 3, 1930.

actual suppuration was present is shown in Table 2.

As would be expected, boils respond more favorably to treatment than carbuncles (Table 3).

TABLE 2

RESULTS OF TREATMENT OF BOILS AND CARBUNCLES BY ROENTGEN RAYS WHEN INDURATION WAS PRESENT COMPARED WITH RESULTS WHEN SUPPURATION WAS PRESENT

Result	Induration present, 58 cases	Suppuration present, 42 cases
Analgesia	54	39
Abortion	28	....
Prompt improvement	15	3
Slow improvement	11	33
Failure	4	6

The technic used in these cases varied according to the stage and extent of the disease. Specifications of dosage for a typical boil were as follows: 135 kilovolts; 4 mm. aluminum filter; 16-inch distance; 5 milliamperes; ten minutes. Carbuncles were given a higher dose (same factors for fifteen to eighteen minutes). Care was taken that the field was wide enough to include all of the diseased tissue. If the removal of the surrounding hair was necessary to prevent infection of the other follicles, an epilatory dose was used. Specifications for this dose were as follows: 80 kilovolts; no filter; 16-inch distance; 6 milliamperes; five minutes. This was used also in the treatment of folliculitis. We have not found it necessary to repeat irradiation of a boil.

COMMENT

It is well known that the lymphocytes are the most radiosensitive cells in the body, and that destruction of lymphocytes is one of the first effects noted following exposure to moderate doses of radiation. It is important, in this connection, to emphasize that in treating inflammatory lesions, large doses of roentgen rays are neither necessary nor advisable because of the great sensitivity of these inflammatory cells.

The mechanism of the effect is not perfectly understood. A plausible explanation is this: Since it is known that small round cells act as a defense against pyogenic infection, and that lymphocytes are extremely sensitive to radiation, it is fair to assume that when these cells in an inflammatory lesion are destroyed, the protective substances in them are liberated in larger amounts for immediate defense than is the case when they remain intact. This theory at least is in accord with known clinical facts.

TABLE 3

RESULTS OF TREATMENT OF BOILS BY ROENTGEN RAYS, COMPARED WITH RESULTS OF TREATMENT OF CARBUNCLES

Result	Boils, 74 cases	Carbuncles, 26 cases
Analgesia	58	25
Abortion	26	2
Prompt improvement	14	4
Slow improvement	30	14
Failure	4	6

There are several advantages in the use of roentgen rays in these conditions. The treatment can do no harm. It is painless and inexpensive, does not consume much time of either the patient or the physician, and is almost always effective. Another advantage is that in the early stages in which other methods offer least, roentgen rays are of most value. If a patient comes with an indurated swelling, suggesting an early boil, the physician has nothing that he can use that will abort the disease. If the indurated type of lesion is treated with roentgen rays, not only are all dressings and infected discharges obviated, but rapid, marked benefit should ensue in more than 80 per cent of the cases, and the lesions should heal without scars.

The disadvantage of this form of treatment is that the facilities for giving it are available only in the larger centers. However, a boil, and particularly a carbuncle, is a debilitating enough condition to warrant the sending of the patient to a place where he can be adequately treated by a method that gives him the best chance for prompt relief.

CONCLUSION

We believe that the treatment of boils and carbuncles in the early stage by roentgen rays is the best at the present time and that it should be utilized more frequently.

SOME OBSERVATIONS ON THE ETIOLOGY OF TIC DOULOUREUX WITH THE CLINICAL REPORTS OF A NEW METHOD OF TREATMENT*

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At the time of our first presentation of the treatment of tic douloureux by the method of alcohol injection, some one objected to this plan of treatment on the ground that it was unscientific, for it only stopped the pain but it did not cure the disease.

At the time, this objection seemed rather trivial to us, because with the majority of the patients, when their pain was relieved they instantly declared themselves to feel perfectly well, and proved their assertion by returning at once to their customary activities.

As our experience increased with this form of treatment this objection, which seemed unimportant at the time, began to interest us more and more. One could, of course, make the same objection with reference to any other nervous condition, such as epilepsy, migraine, asthma, hives, etc. As soon as their attacks stop, the patients are to all visible appearances entirely well.

There were, however, always a few, indeed a very few—to use a political expression—who made up a troublesome minority. This minority after an apparently successful injection, and by successful we mean an injection which produced anesthesia in the entire area of the distribution of the branch of the nerve injected, while their severe pain was relieved, still complained of various annoying sensations in this area of anesthesia. These sensations differed greatly in description if not essentially in character, because they could all be classified under the title of paresthesias. In some the complaint was simply of the numbness which the injection had caused. In others the sensations were described as of a burning, creeping, crawling, pulling, drawing, pressing nature. They also varied in intensity of complaint as much as they did in the variety of their description. In some they were merely casually mentioned when the patients were asked about their faces. In others they seemed so distressing that the patients made almost constant complaint of them, and occasionally a patient would say these sensations had caused him even more suffering than his neuralgic pain had done.

All of us know very well the tendency of a patient, no matter what symptoms they have had before taking, so to speak, to date everything after taking, not to some change in the character of their symptoms or any constitutional weakness in themselves, but to the method of therapy, whether of a medicative or surgical nature. And so these patients were only following the general rule of human nature when they attributed as the cause of their subsequent discomfort the effects of the alcohol on the nerve injected, whether rightly or wrongly, since the paresthesias occurred usually in the nerve injected.

Looking at the matter from the patient's angle it was easy to see the justification for their way of thinking. These paresthesias occurred mostly in the area of distribution of the nerve injected.

The area supplied by other branches remained comparatively free. Our first thought was also to accept the patients' reason and consider a perverse or insufficient reaction of the nerve to the alcohol as the most likely cause. But with further consideration and experience with these paresthesias it was quite evident that other probable sources should not be ignored.

We know quite well that oftentimes, especially in a fundamentally functional nervous patient, one clinical syndrome as the result of treatment is transformed into what seems to the patient something else entirely different.

As an illustration, we have frequently observed a quite definite transformation in epileptics as the result of treatment, the epileptic attack either being greatly modified in character, or even taking on a migrainous character. Then the patients, ignoring the fact that their epilepsy had disappeared, would return complaining that our medication had given them headaches which they did not have before. Only the other day we had a patient with narcolepsy in whom the first

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reaction to the treatment was a change in the clinical picture from that of the sleeping attack to one of a quite severe nausea. Naturally, this patient as well as his family placed the blame for the nausea on the medication.

If these paresthesias had only occurred in patients who had received injections of alcohol we might still be attributing the cause to alcohol.

It was soon brought to our observation that patients who were surgically treated and never had received an alcoholic injection also were subject to the same distressing paresthesias.

Frazier reported in 1925 ten surgical patients who suffered severely after their operation from similar symptoms. Of this series he at that time says the sensory root operation in five instances had been performed and in all but one of these no doubt there had been an error in diagnosis. The patients did not have trigeminal neuralgia.

Because we feel that such patients aid very materially in broadening our conception of the etiology of this type of neuralgia we will cite his report on one of them. This case was operated on March 23, 1916 (section of the sensory root). Some features of the neuralgia were atypical but others seemed sufficiently characteristic to justify the major operation. Course, March 7, 1917 (almost a year later): Following operation the patient complained bitterly of a burning, throbbing sensation in the upper and lower alveolar processes and in the molar region. These disturbing sensations continued day and night without intervals of relief, and on one occasion it was noted that there was a vasomotor flush on the affected side when the pain was severe. The patient was seen a number of times in the course of the intervening seven years until May 2, 1923, when she was readmitted to the University Hospital. On May 6 the superior sympathetic ganglion was excised and the perisympathetic plexus stripped from the common carotid artery from a point 2.5 cm. below the bifurcation to 2 cm. above the external carotid artery. Result—April 11, 1927, the patient wrote that she was feeling worse rather than better and that she was never without a pulling, burning, throbbing sensation in the cheek.

In commenting on these ten cases Frazier says the records speak for themselves. In only one case did the patient obtain any relief, and in this case there still remains the doubt as to whether the relief was permanent, as the patient cannot be traced.

In conclusion, the author says, "This problem is of some importance because the number of patients afflicted with conditions that have these irregular form pictures is not small and the patients themselves lead a wretched existence. That one of the patients was entirely relieved by Christian Science suggests a functional rather than an organic basis for her pain, and one may have to be content to view the condition as of psychogenic origin and discontinue any effort to modify or relieve it by physical measures."

In a later article under the title "Fourteen Years Experience With Fractional Section of the Sensory Root as the Major Operation," Dr. Frazier has again discussed this subject. This article presents, as its title would indicate, a technic for the partial section of the sensory root in order to preserve intact the normal sensation in as large a part of the face as possible and still successfully relieve the pain. As to the reason for this modified operation the author says, "One may well inquire why so much concern about conserving as much of the root as possible. To appreciate the significance of this discussion it must be understood what the patient's reaction is to the total loss of sensation in the affected region. So agonizing is the pain that the patient before operation welcomes any measure that guarantees relief. After the operation he notices not only that there is no sensation but also that the face and tongue seem swollen. Many patients accept these and other sensory defects, and continue content so long as they can live in the happy assurance that they will never have another paroxysm. To some of the others these wide-spread sensory disturbances continue to be a source of more or less annoyance. There is a smaller group who develop paresthesias after the operation. In a few instances these paresthesias are a source of great annoyance."

We have not infrequently seen this type of case, of which the following is an excellent example.

On January 16, 1925, Mr. H. was referred to us by Dr. Alfred Hoff for the treatment of tic douloureux by alcoholic injection. Patient was 60 years old, occupation railway mail clerk, married, wife living and well, three children living and well, no history of serious illness. Has had pain of a spasmodic nature in the right side of the face for nearly a year, starting ap-

parently with a bad tooth. This was extracted. Then the pain moved to the tooth in front of this, which was likewise extracted. The pain kept moving forward until four teeth in a row in the right lower jaw had been removed. The pain still continued. Touching the right lower lip, the second right lower incisor, eating, spitting, talking, etc., brought on the pain. Pain has been so severe the past week that the patient was scarcely able to eat or talk. The response of this patient to the injection of both the second and third branches, which were successfully injected, was chiefly a change in the nature of symptoms. The severe shooting pain was stopped but in its place the patient complained of a burning, crawling feeling, especially in the right eye, which made him very uncomfortable, but he had no tic pains. You will note the burning, crawling sensations in this instance were located in the right eye, the area of the first branch and entirely outside of the distribution of the two branches which were injected. Further injections made over a period of several months did not seem to lessen the patient's discomfort. Because of this he was advised to go to the Mayo Clinic in Rochester for the radical operation, which he did. The operation seemed to increase rather than diminish the distressing paresthesias. The patient was in the habit of visiting us in the office and calling us on the phone to curse the unlucky day on which he submitted himself to the surgical procedure. The way he expressed it was, "The sensations were bad enough after the alcohol injections but many times aggravated after his operation."

We have devoted so much space to the description of such patients because in our opinion they do not indicate so much a mistaken diagnosis as they do the degree of the constitutional nervous predisposition and its sensitiveness to central reactions in such patients. We have in music Yankee Doodle with variations, and sometimes it is difficult to recognize the well known air because of the variations. So also we have migraine with variations, and likewise tic douloureux with variations, the variations depending upon the degree of burdening of both the vegetative and the cerebro-spinal nervous systems of the patients.

We have a letter from this type of patient, whom we unsuccessfully injected without relieving his severe spasmodic pain, and then afterwards gave him the treatment which we are going to describe later on. We want to read this letter. The date of this letter is March 3, and it is in answer to an inquiry of ours as to the patient's condition.

"It is now six months since you operated in my face, and it is still stiff. There is yet spotts that I don't feel a pin point. I can't open more than three-fourths of an inch. That side have been ever since I was with you. It bothers my hearing and thet ear and I have sting in that eye now and then, specially when I reed. My mouth feels inside as if it was scalld after the pain is over. I never feel anything hot ther inside. When I drink hot coffee it feels like a cold piece of rubber inside, but when I stick my finger in to feel if it is cold I find it just as warm as the other side, but when I drink cold water or milk it feels just like it run a cold stream of water outside. I hundred of times try to wipe it up and was nothing, just dry. I cannot go any place. I am afred I get cold in my chin. I was out once this winter and got cold in it. I was just to the mail box and got so stiff in my jaw so I could not open it in three days. I had to suck milk for food. Yes, there is lots of more things I could tell you. Now, Dr., I am not kiking about anything. I just will tell you how it is working on me. I must say I have had a good winter's sleep every night without thas killing like paen. but Dr. you never told me how it was going to feel in any way or acksion. I was afred ones to get lockjaw or be perliced in my face. it would not have been more than right to post me a little about what was to bee. I sokt bread in coffee and ate in the hospital for two days. I could only drink my coffee but still pey for meals. Well Dr. I will hope for the besst. Must stop, etc."

This letter has all the characteristics of the fundamentally functional nervous patient. It shows plainly that the patient is of a marked introvert type. Every sensation, and especially those affecting his face, he describes in analytic detail. Fear and worry fill his mind constantly, fear of lockjaw, paralysis, cold, apprehension of what the various sensations indicate, just like any neurasthenic. Then there is a touch of the paranoid taint shown in his reproach, "But Doctor, you never told me how it was going to feel in any way or acksion." Also in his expression relating to his stay in the hospital, "I could only drink my coffee but still pay for my meals."

It does not seem to us in the consideration of the etiology of the so-called trigger zone, which is so constant and so important in these cases since it is the spot of spots from which the pain is released, has been given sufficient importance. This trigger zone is the only place in the whole sensory area of the fifth nerve which shows any objective symptoms. Outside of this zone sensory symptoms to objective methods of examination seem perfectly normal. In this zone sensation to touch and pin prick is intensely hyperesthetic. The slightest touch or movement here, even in some cases the threat to touch, releases the spasm of severe pain. One of the peculiar characteristics of this trigger zone is that it may lie in the area which is supplied by the third

branch, as in the tongue or lower lip, while all the pain occurs in the first and second branches around the nose, upper cheek, eye, and forehead.

The successful injection of the two branches where all the pain is experienced does not relieve the pain in the slightest. In order to stop the neuralgia, the trigger zone and the branch supplying this area must be sought out and this branch injected. Another thing worth noting is that the location of the trigger zone may change quite suddenly. Whereas it may have been located the day or the week before, or in the previous attack, in the lower lip supplied by the third branch, it may leave this area and take up its abode somewhere on the side of the tongue; or even abandon the area of the third branch entirely and manifest itself in some spot in the distribution of the first or second branches.

Then again these hypersensitive spots or trigger zones may likewise disappear completely as suddenly as they came, and with their disappearance, presto, like magic the spasmodic pain stops. It is quite plain according to this that it is not the blocking of the nerve with alcohol which is the essential objective in the injection, but the rendering anesthetic the trigger zone or zones which seem to be the sine qua non in the production of the pain. The curious behavior of these trigger zones would of itself suggest the functional nature of the condition and indicate its systemic or central character.

Genuine tic douloureux may not only change its location on the same side of the face but in one attack may present itself on the right side of the face and then later on transfer its field of action completely to the left side of the face, or vice versa, the right side remaining perfectly free from either pain or any disturbance of sensation. We have also seen this phenomenon occur not infrequently in cases of migraine. The pain here may appear for years in the migrainous attack above, say, the right eye, and then without rhyme or reason leave and appear in a similar location above the left eye.

The following case of "tic" is an example of this.

Mrs. C., aged 56, occupation housewife, was referred to us by Dr. George Sherwood, January 7, 1912. At that time the patient complained of pain in the left side of her face in the distribution of the second branch in the region of the upper lip and nose. Successful injection of this branch did not relieve the pain. With the injection of the third branch, the patient obtained complete relief. A year later this patient returned with the tic on the opposite side of her face, the left side having given her no furthr trouble. An injection of the right third branch gave the patient complete relief. This patient has returned at intervals of a year or two for relief of her tic pain, which has sometimes returned on both sides of her face but for the most part the return has occurred on the left side. The last time we injected her was in June, 1927. Then, both the second and third branches on the left were injected, the right being entirely pain-free.

Our experience with tic douloureux has been largely coincident with what may be called the focal infection period and its importance in disease. We, in keeping with medical thought in general, have naturally been greatly instructed and influenced by it, especially since we were confronted with a condition which was situated so close as the face to the great centers of focal infection. The profession, particularly those surgically inclined, in times past have seemed determined to find the etiology of tic in some source of focal infection. We are of the opinion that the number of good teeth alone which have been extracted with the thought in mind that they were the chief etiological factor would run into the millions.

But some one may say that he knows of a case which was completely relieved of his pain after the removal of a bad tooth. Granted this to be true, this does not prove that the tooth was the factor. For every tooth which has been pulled with subsequent relief of pain, ten thousand have been extracted with no benefit whatever.

We have often heard of cases of epilepsy in which the epileptic attack has remained away for months after a circumcision. We would suggest another explanation for this, which is that in both instances a hyperesthetic or trigger zone somewhere has been temporarily dulled by the effect of the local or general anesthetic.

It is interesting to note what the neurological opinion on this subject was just preceding the focal infection era. Space will only permit us to quote one authority. We have selected the one who was considered the most preëminent in our language during our medical school days. This was the great English neurologist, Gowers. We will quote from Gowers' textbook on "Diseases of the Nervous System" published in 1893. Gowers says, "Neuralgia of the fifth is probably more frequent than all the other varieties to-

gether, and it presents in most typical form the characteristic symptoms of the disease. Nor is this surprising when we consider that the fifth is incomparably the most important nerve of common sensibility in the body." Of tic douloureux he says, "The pain is invariably in the region of the fifth nerve, sometimes in the whole nerve, sometimes in a part only, but rarely confined to a single branch. Convulsive spasm in the face may accompany the pain (convulsive epileptiform neuralgia)." We have quoted this last sentence especially for the name which he applies to it, "convulsive epileptiform neuralgia." Gowers also state, "Neuralgic pains are common in hysteria. Every variety of true neuralgia may be met with due to the neuropathic disposition, and they present the characteristic distribution, tender points, etc., of the ordinary forms." He speaks of hysterical neuralgia due to the neurasthenic disposition and then sharply distinguishes other forms with a different etiology as gouty, diabetic, herpetic, malarial, syphilitic, degenerative, etc. About the only difference between Gowers' article on neuralgia and more recent articles is that he makes the neuropathic type of a central and endogenous origin with the fundamental cause as the neuropathic disposition a very important etiological factor while more recent articles, influenced no doubt by the brilliant results in many diseased conditions by the removal of focal infections, tend to minimize the endogenous factor and to place more stress on some exogenous cause. In the light of our experience we would regard Gowers' article in 1893 as the more comprehensive.

We have long felt from an intimate experience with these patients in the course of twenty years of injection treatment that tic douloureux was not only, as Patrick has said, a disease "sui generis," "etwas für sich," but that the most important and essential nature of it was in the neuropathic predisposition of the patient. This conception answers another question which came up in the discussion at the time we read a paper on this subject before the State Society at St. Cloud in October, 1924. Dr. Michaels, we believe it was, asked why, if trigeminal neuralgia was essentially of a functional character, it makes its first appearance in the majority of cases in the later decades of life, while our experience with functional conditions would indicate that they appear during the early decades. The answer to this is that functional nervous conditions have appeared in these patients many years before their tic douloureux, only they presented such an entirely different clinical syndrome with varying localizations that they were never really associated either in the minds of the patients or the physicians whom they consulted as in any way having a relationship with their tic pain. We have observed many patients who substantiate in their histories this statement.

We have much evidence in our own experience as well as excellent medical corroboration to cause us to believe that a true tic douloureux presupposes the neuropathic disposition and is therefore anaphylactic, or, perhaps better, allergic in nature. By the term allergic we mean that some localization in the body is especially conditioned or sensitized because of the neuropathic predisposition through a dysfunction of the vegetative nervous system. This conditioned, sensitized localization does not necessarily need to be in the area of the fifth nerve causing tic douloureux. It may lie in the cervix uteri producing severe menstrual pain, or in a thalmic or subophthalmic area of the brain upon whose function our emotional control depends and thus produce a mania or a melancholia, or in some cortical brain area causing idiopathic epilepsy. In the case of tic douloureux the area of the fifth nerve happens to be the conditioned place.

The following case is a good illustration of what we have just been saying.

Mr. M., aged 45, a farmer, was referred to us on April 14, 1930, by Dr. Max Kern of St. Cloud, Minnesota. His chief complaint was that of a facial spasm on the left side which began four years previous and had persisted intermittently ever since. There was nothing significant in his physical or neurological examination. The significant facts were discovered in his family history. His father was an asthmatic. His mother and one brother had severe sick headaches and another brother was subject to hay fever. Here was undoubtedly a family with a marked allergic tendency in which three members at least manifested their allergic hypersensitivity by exhibiting three different clinical pictures occurring in different localizations. It must be quite evident that local irritations and focal infections in such cases could only be of minor importance. This family history should convince us of the constitutional and inherited nature of the different clinical syndromes in functional nervous conditions.

Believing firmly in this conception of all so-called functional nervous conditions and also

having the feeling that genuine tic douloureux belongs in this category, we selected a form of therapy which has in recent years, according to numerous favorable clinical reports, attained some signal successes in many functional nervous cases. This is the so-called fever therapy. This is not the place here to enter into any general discussion of the fever therapy.

Grete Drecker in an article on Fever Therapy in Schizophrenia says, "It produces an effect on the morbid process itself." Speaking especially with reference to the malaria treatment in general paralysis he says, "Through the infection the circulatory conditions in the entire body are changed and the circulation itself quickened. As a result there takes place a stimulative and tonic influence on all the vital systemic processes. In this way the defense mechanisms of the body are called forth as they are in the natural infections."

There has been much debate as to the rôle which the fever plays in the beneficial effect. What particular part the fever itself plays we do not know. We do know this, however: without a somewhat severe reaction with chill followed by a fever of at least 102° F., better 103, 104, or 105, the therapeutic effect is not so favorable.

We selected in this series of cases milk as the fever producing agent. The milk was boiled and allowed to cool and then injected intramuscularly into the buttocks four days in succession, beginning with 5 c.c. the first day and increasing the dosage on the succeeding days by 5 c.c. or a lesser amount according to the degree of reaction obtained in those cases where milk failed to react vigorously enough we used triple typhoid as the foreign protein.

We gave the milk four days in succession in order to secure a series of quick reactions. The first injection almost invariably increased the pain. Even during the height of the reaction in the fourth injection, rather severe tic pain was present in some of the cases.

In no case was the fever reaction less than 102, and in some cases it reached a height of 104 and even 105. These reactions lasted only a few hours and then quickly subsided. During the treatment and continuing for some time afterwards, we gave a capsule containing from one-half to two-thirds of a grain of phenobarbital with 10 grains of calcium lactate after each meal. In some of the cases during the reaction morphine or some derivative of it was administered either hypodermically or by the mouth, as needed to make the patients comfortable.

We have treated ten cases thus far according to this method. In all of these patients the tic was of long standing. One case was first injected with alcohol by us in 1908. During all this time this patient, whenever her pain came back, which it did at intervals varying from one to several years, returned for another injection. So it may be said of these patients that they knew their tic. They also had very little faith in any other form of therapy other than the alcohol injection. It was not easy to persuade them to accept any other plan of treatment.

The first patient was Mr. S., 80 years of age, salesman, referred to us in 1927 by Dr. T. J. Moynihan of this city. His first alcohol injection was May 19, 1927. His last was two years later on May 25, 1929. On August 16, 1929, this patient came to the office complaining of severe tic which kept him awake during the night and made it very difficult for him to eat or talk. He was given 5 c.c. of milk intramuscularly; also the capsule mentioned before. The patient was directed to return to his home in Minneapolis and go to bed at once. In our experience it is usually an hour or longer after the injection before the reaction occurs. The next day he was unable to come to the office but reported having had a severe chill after going to bed, followed by fever, increased tic pain in his face and a general malaise. When we saw him several days later he had not entirely recovered his strength. As he was free from pain we did not repeat the milk injection but continued his capsules. Since this time we have had two reports from this patient. On November 15, 1929, he wrote us that for two weeks after his operation he was entirely free from pain. After that he was for several nights awakened by severe pain once each night, and during the daytime said that touching either the left side of his nose or the upper lip caused flashes of pain in the face, not of a severe nature. "These little pains," quoting from patient's letter, "kept up right along until three weeks ago when they suddenly ceased troubling me and I have been entirely free from pains of any sort in the nerve ever since." On March 21, 1930, the patient came to office to report on his condition. He said he had had only two attacks of real sharp pain since his report to us in November. These were about two weeks apart, and the last one was three weeks previous. They lasted only a few seconds. There is hardly a day, however, when pressure on his lip will not give him a little sharp twinge, and sometimes he notices it in eating. He still takes his capsule regularly.

The result in this patient cannot be said to have been entirely satisfactory, but he has been much more comfortable than he was before. We

must also remember that he only had one milk injection. His pain has never been troublesome enough since to cause him to feel the need of another injection.

Space will not permit us to report all of these cases. We will report only the ones which were especially difficult, where the trigger zones were not only numerous but also hard to penetrate with alcohol.

The first case of this character was Mr. E., aged 46, referred to us by Dr. Carl Larsen on September 28, 1926. This patient had very severe attacks of tic pain in the second and third branches of the fifth nerve on the left side of the face. His chief trigger zone seemed to be located around the base of the tongue and the pillars of the fauces on the same side, a hard place to reach with the alcohol. He was injected by us successfully at that time and once afterwards in November of the same year. He then remained free from pain until September, 1929. At this time his pain returned in the same locality and to the same agonizing degree. This patient was also a bleeder, which made the alcohol injection still more difficult. We injected the third branch first, successfully, but without relief of pain. In attempting to inject the second branch a severe hemorrhage occurred which caused such a swelling of the entire face that a repetition of the injection before the subsidence of some of the swelling was impossible. Here a difficult situation presented itself. The alcohol injection together with the swelling, only seemed to aggravate the patient's painful attacks. In order to relieve the patient in this dilemma we suggested the milk injection to him. We gave him the first injection and a prescription for the capsules as in the first case and permitted him to return home. Although the patient was a very robust individual all of his reactions were exceedingly severe. The patient's wife telephoned me the morning after the third injection saying that her husband had been restless, feverish, and a times delirious, during the night, and wished us to come and visit him. We found him with a temperature of 103, pulse 100, in a somewhat drowsy and stupid condition. After a good saline catharsis, by the evening of the same day all of these symptoms had disappeared. After the second injection of milk the patient never had another tic pain. A letter from him on the 14th of last month says, "In answer to your letter in regard to the trifacial neuralgia treatments you gave me six months ago, they sure helped me as I have had no pain at all since. Feel fine. Thanking you kindly, etc."

The next patient was Mrs. J., aged 66, referred by Dr. Victor Thompson of Marine, Minn. She was a housewife, lived in Stillwater, Minn., and the working diagnosis was tic douloureux of the right side. The patient had had pain in the right side of the face since November, 1925. The patient consulted us the first time April 5, 1926, because her pain had become unbearable. At this time both the second and third branches of the right fifth nerve were injected. These injections gave her complete relief from pain until in August, 1928, a period of over two years. On August 27, 1928, the right third branch was injected because her pain had returned. The patient was again relieved of the pain until in October, 1929. On October 26, 1929, we again injected the right third branch, securing anesthesia in its whole area except for a small spot on the right side of the tongue at its very tip. This region still remained sensitive to pin prick and the patient's pain continued the same as before the injection. Having in mind our success with the patient just reported we changed our treatment from the alcohol injection to the milk. On October 26, 1929, the patient was given 8 c.c. of milk intramuscularly and on the three following days 10 c.c. The reaction after each injection was quite marked, accompanied by chill and fever. After the second milk injection the pain disappeared completely. A letter dated March 5, 1930, from the patient says she had not had any pain since the last treatment.

The next patient, Mrs. R., was 42 years of age in 1908 when we first injected her. She has been successfully injected at different periods since then, the last time on February 4, 1929. On November 9, 1929, this patient returned for another alcohol injection. Instead of the alcohol injection she was given the four milk injections with fair reactions. Some pain, however, still continued after the fourth milk injection, so my associate, Dr. Engberg, after an unsuccessful alcohol injection repeated the four milk injections on November 19, 1929, just seven days after the first series. During the last injection the patient had a moderately severe anaphylactic reaction which was promptly relieved by a hypodermic of adrenalin. The patient after this series was relieved of her pain. A letter received from this patient dated March 4 said she had some "jumps" from jaw to tongue but no pain. By "jumps," from our previous experience with this patient, she means some muscular twitching in this locality.

The last patient which we will report at this time is Mrs. K., aged 54, referred to us September 16, 1925, by Dr. James Blake of Hopkins, Minn. In the history at that time, the patient stated that she had always been well except for severe migraine in her earlier years, especially at her menstrual time and when she became excited. This patient had trigger zones in all three branches of the right fifth nerve, so all three branches were injected. It was somewhat difficult to stop her pain but this was finally accomplished.

She remained pain-free until last summer, when the pain gradually returned and in September became quite severe. On October 2, the patient came to the hospital and all three branches of the right fifth were reinjected in the course of four or five days. Although the anesthesia produced by the injections seemed good, especially in the second and third branches, the pain still continued, apparently starting from various places in the distribution of the first branch. On October 17, 18, 19, and 20 the patient was given injections of milk: 5 c.c. the first day, 10 c.c., 12 c.c., and 15 c.c. on the the succeeding days, reacting well to each injection. The pain stopped in this patient between the second and third injections. In a telephone conversation last

week with her physician, Dr. Blake, in regard to her present condition, Dr. Blake said the patient was in good health and pain-free.

We have either letters or reports in person from all of the ten patients who have received the milk treatment, and thus far they have all remained pain-free except the first patient reported, who received only one milk injection. Before discharging these patients, we subjected them to all the irritations which had formerly started their pain, asking them to try in every way to bring on their pain by eating, drinking, talking, etc., and then, when they were unable to do so, by rubbing both lightly and vigorously the places where the trigger zones had previously existed.

Whether this method of treatment is going to be an addition to our therapy of tic douloureux, neither the number of cases nor the length of time which has elapsed since they have been treated will of course permit us to say. We do not in our fondest imagination expect it to supplant either the need for the injection of alcohol or the radical operation, as time and voluminous clinical experience from many sources have established the undoubted value of both these procedures. We simply report this treatment as our experience in ten cases. We know in these cases it has helped us greatly to deal successfully with some very difficult situations.

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RULES OF THE COMMITTEE ON FOODS

The Committee on Foods of the Council on Pharmacy and Chemistry publishes a revised statement of the information which should be submitted to the Committee by manufacturers who wish their food products included in the book "Accepted Foods." The Committee will consider all food products for which health claims are made as coming within its purview. If the health claims made are satisfactory to the Committee, in view of the composition and process of manufacture, the Committee will accept the product for its book "Accepted Foods," and will grant to the product the use of the seal of the Committee. If the product is found to be outside the scope of the Committee in that no health claims are made for it, and if the product and the advertising are otherwise satisfactory, the product will be exempted. A list of exempted products will be published in the book "Accepted Foods," and such products will be permitted to be advertised in the publications of the American Medical Association. A list of rejected foods will be published in the book "Accepted Foods" together with the reasons for such rejections. Rejected products will not be permitted to advertise in any publication of the American Medical Association. Infant foods, whether health claims are made for them or not, are considered to be within the scope of the Committee's consideration. (Jour. A. M. A., May 3, 1930, p. 1407.)

COLLOSOL KAOLIN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Collosol Kaolin is the name given by the Crookes Laboratories, Inc., to a product stated to be "a prepared clay, giving a comminuted chemically inert material of high absorptive capacity." The use of the product is recommended in various conditions, including rheumatism, neuritis and asthma. The Council points out that the Germans, who had employed it against dysentery during the war, abandoned its use and substituted charcoal. The Council declared Collosol Kaolin unacceptable for New and Non-official Remedies because of the unwarranted therapeutic claims and because of possible dangers from the therapeutic use of the product. (Jour. A. M. A., May 3, 1930, p. 1406.)

RECRESAL NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Recresal is the product of Chemische Werke vorm. H. & E. Albert, Wiesbaden-Biebrich, Germany, and that, according to the information received from this firm, the product is sodium phosphate monobasic and is therefore nothing more than the well known acid sodium phosphate, which is official in the U. S. Pharmacopeia as sodium biphosphate. (Jour. A. M. A., May 3, 1930, p. 1406.)

MODERN TREATMENT OF VARICOSE VEINS*

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MUCH has been written recently concerning the modern treatment of varicose veins—sufficient, perhaps, to convince the medical profession that surgical removal of varicose veins is almost a procedure of the past. Having made over 10,000 injections on over 1,000 patients during the past eight and one-half years, we are convinced of the efficacy of this treatment.

HISTORY

Since the invention of the hypodermic syringe, attempts have been made to obliterate these veins by the injection of various solutions, but not until 1911 did this become an approved and practical method.

Linser observed that in postoperative and postpartum phlebitis, the thrombosed vein usually became fibrosed and gradually disappeared by absorption. He also observed that in the treatment of syphilis with bichloride of mercury the injected vein frequently became thrombosed, fibrosed, and gradually absorbed. These two observations led him to attempt the obliteration of varicose veins by means of bichloride of mercury injections. From 1911 until 1916 he used this exclusively as a sclerosing solution. He and his followers made many thousands of injections with practically no serious results. His end-results far surpassed any method which had been employed for the treatment of varicose veins up to that time.

In 1917 he substituted a strong sodium chloride solution for the bichloride of mercury solution. He believed this was an advanced step for two reasons: (1) because of the more rapid results obtained, and (2) because of the "entirely unfounded aversion" of many medical men to intravenous injection of bichloride of mercury. The latter prevented the widespread use of this method. Many of our most ardent advocates of this method in this country have acquired this "entirely unfounded aversion" to the injection of bichloride of mercury.

In 1925 Linser first published his results with sodium chloride as a sclerosing solution. About 1916 Sicard of Paris began the same work, using sodium bicarbonate; later he substituted sodium salicylate, which is still used widely for this purpose in France. In 1923 Genevrier published his results using quinine hydrochloride and urethane. This solution still holds an important place among sclerosing solutions. In 1926 Nobl of Vienna published his results with calerose, an invert sugar, as a sclerosing solution.

This work was first introduced into this country by Kretchmeier, who came to this country from Germany about 1920. He did his first work at the clinic at Red Wing, Minnesota. He left no written record of his work but some of his patients presented themselves at the Out-patient Department of the University of Minnesota for a continuation of this treatment. His results convinced us that the work was far in advance of anything we had been doing for these unfortunate patients and deserved investigation.

After reviewing the German and French literature we began this work in December 1922. The two solutions widely used at that time, according to the records in the literature, were bichloride of mercury in Germany and sodium salicylate in France. The medical profession of this country were naturally very skeptical then and almost universally advised the patients against it. We, therefore, selected only the most refractory cases. During the first year we selected only those patients with badly ulcerated conditions (Figs. 1 and 2). Those ordinarily considered surgical were refused treatment.

We tried the two solutions about which we had authentic reports of good results—sodium salicylate and bichloride of mercury. Sodium salicylate when injected into the vein caused a severe cramp. Already advised against this method of treatment by physicians, this cramp was frequently sufficient to frighten the patient away and the treatment was at an end. Bichloride of mercury when injected into the vein usually gave no unpleasant sensation at the time of injection. The patient submitted to this more readily and returned for repeated injections. This led us to

*Read before the meeting of the American College of Physicians, Minneapolis, Feb. 12, 1930.

the almost exclusive use of this solution until 1925, when Linser published his results with sodium chloride solution.

SCLEROSING SOLUTIONS NOW IN USE

Bichloride of Mercury (1 per cent solution). This solution is placed first not because it is the solution of choice for this work but because it was the first solution to fulfil effectively the requirements of a sclerosing solution. We used it almost exclusively from 1922 to 1925. Until Linser published his results with sodium chloride solution, we found no solution more desirable.

We have made in all over 5,000 intravenous injections of bichloride of mercury, and in no case in which we limited the amount to 1 c.c. of a 1 per cent solution at one session did we get any untoward results except an occasional slough.

We have had, in all, four cases of enteritis. In two cases we injected more than 2 c.c. at one session. In one case we injected sodium chloride in one leg and bichloride of mercury in the other leg. This patient had an enteritis for nearly two days, but then cleared up promptly. In one case we injected invertose in one leg and bichloride of mercury in the other leg. In this case we produced vomiting and a bloody diarrhea which lasted for nearly two days. The patient went to work on the third day.

We still use this solution in selected cases. In very sensitive patients we frequently start the patient with this solution. When it is necessary to inject hard, fibrotic, or infected areas, this solution is often the solution of choice. Occasionally we find a case in which we are unable to obtain obliteration with other solutions and do get results with this solution. We rarely inject this solution more often than every second day, although it has been shown that practically all bichloride is eliminated in twenty-four hours. The results with this solution are necessarily slow and we usually use salt or sugar solution for large or extensive varicosities.

Sodium Chloride (20 per cent solution). Sodium chloride solution gives excellent and rapid results; perhaps more rapid than any other solution now in use for this purpose. The two important objections to this solution are, first, the disagreeable cramp accompanying the injection and, second, the extensive slough produced by a perivenous injection or even by a slight seepage of the solution into the perivenous tissue.

Sodium Salicylate (20 per cent solution). This solution gives a fairly consistent thrombosis. The cramp accompanying the injection and the slough caused by escape into perivenous tissue are much



Fig. 1. *(Left)* Type of cases treated during our first year in this work.
Fig. 2. *(Right)* Ulcer open for nine years, now closed for eight years. Operated three times previously.

the same as those produced with sodium chloride solution. It cannot be used in large doses, Occasionally it may produce a thrombosis when other solutions fail.

Quinine Hydrochloride and Urethane (10 per cent solution). This solution produces less slough than the above mentioned solutions if it escapes into the perivenous tissue but cannot be used in large doses without producing unfavorable symptoms. It should not be used in pregnant women.

Invert Sugar (50 to 75 per cent solution). Invert sugar, perhaps, more nearly than any solution so far reported, fulfils the role of a sclerosing solution. It seldom produces cramp. It very rarely causes a slough in the perivenous tissues. However, it does not give as consistent results as any of the afore-mentioned solutions. The density of the solution necessitates a larger needle. This increases the discomfort to the patient and makes entrance to the vein more difficult.

The almost entire absence of slough and cramp makes this the solution of choice in the great majority of cases. We much prefer the stronger solution. The weaker fails to thrombose in many cases. If we do not get results with this solu-

tion we then try others. Nobl says he does not expect greater than 90 per cent of results with invert sugar.

Mixture of Dextrose (50 per cent solution) and Sodium Chloride (30 per cent solution). Recently this mixture has been put on the market.



Fig. 3. Shows destruction of intima at site of beginning thrombus.

The results are excellent so long as none escapes into the perivenous tissue, but otherwise a troublesome slough results. Dextrose (50 per cent solution) gives very good results but not so consistent as when mixed with salt.

As we travel from clinic to clinic in this country as well as in Europe it is interesting to observe the enthusiasm of various men over some favorite solution or particular method of treatment. No doubt one does become more proficient with any particular solution or method he has employed for a long period of time, but any of the above mentioned solutions will give excellent results with faultless technic. Merely getting the solution into the vein and keeping it there will give a high percentage of thromboses, but a more refined technic will give a more consistent thrombosis.

APPARATUS AND AMOUNT OF INJECTION

We use a 2 c.c. Luer syringe for bichloride of mercury, quinine hydrochloride and urethane, and sodium salicylate solutions with a gauge No. 26 needle. We never use more than 1 c.c. of a 1 per cent bichloride of mercury, 2 c.c. of quinine hydrochloride and urethane, or 5 c.c. of sodium salicylate solution, at one session. With sugar and salt solution we use a 5 c.c. or 10 c.c. syringe, making two or three injections of 5 c.c. or 10 c.c. at one session. For invert sugar we use a gauge No. 21 needle.

CONTRAINDICATIONS

The more we have observed the results of this work the more we feel that the contraindications are very limited. Practically every patient who is not disabled by some other pathological condition may have his varicose veins treated by this method if cautiously done. Diabetics are treated if they are sugar free at the time of treatment. Nephritics are treated if their symptoms are not marked. These patients must be treated cautiously.

We have recently treated over forty cases of old thrombo-phlebitis with good results. We usually do not accept them for treatment if they have had an acute thrombophlebitis within a period of six months or unless we are certain of the lack of function of the involved vein. In these cases we always go slowly and cautiously. If the thrombosis is not extensive it is not likely to cause trouble in any of these conditions.

Pregnant women are treated to relieve distressing symptoms. If it is the first pregnancy and the patient is experiencing no marked distress, we usually advise her to wait until after childbirth. The varicose veins will frequently then disappear. If they persist between pregnancies we do not hesitate to produce a rather extensive thrombosis, if necessary, during pregnancy.

EMBOLI

During the first years of this work we were continually asked if we were fearful of emboli with this treatment. The records of the German and French work had convinced us that it was not so important a factor as one might suppose.

The thromboses we had been accustomed to observe had been, perhaps, in most instances, infectious in origin. These are produced by a chemical irritation of the intima causing a necrosis of the intima (as shown in Fig. 3) with a deposit of fibrin from the blood at this point and a consequent interweaving of the clot with the wall of the vessel. This made the breaking

off of emboli less likely than in the ordinary thromboses which usually lie loosely in the lumen of the vessel.

A study of the varicose veins has indicated the absence of circulation in these vessels. The valves become incompetent and the blood stands in them much the same as water in a stagnant pool and merely seeps through the communicating veins into the deep veins where it is carried back into the main circulation. Jentzer, with radiograms after the injection of strontium bromide into the veins, first demonstrated that the varicose vein really filled from above and emptied into the deep veins below (Fig. 4). Sicard later confirmed his work with radiograms after the injection of lipiodol. This would indicate that emboli, if they should break off, would be more likely to pass distally than in the normal direction.

However, the fact that pulmonary emboli have been demonstrated following these thromboses indicates that the above is only partially true and that under certain conditions the blood may pass in the normal direction and carry emboli to the pulmonary artery.

McPheeters and Rice, in reviewing the literature, collected 53,000 cases injected for treatment of varicose veins, with only seven fatal pulmonary emboli. This is a small percentage of mortality, yet high enough to warn us against any procedure which might increase the possibility of this unpleasant complication. In over 10,000 injections we have observed no case in which anything of this nature has occurred. Kilbourne calls attention to the fact that fatalities from pulmonary emboli have occurred for the most part in cases that have received a large number of injections at one session, or in those with a recent thrombophlebitis.

NUMBER OF INJECTIONS AT ONE SESSION

Some of the advocates of a large number of injections at one session argue that we never thrombose more than the varicose vein. This is not entirely true. The discovery of this method of thrombosing veins resulted from thrombosis of the normal or apparently normal veins of the arm following the injections of bichloride of mercury for the treatment of syphilis. Perhaps thrombosis does not extend widely into normal veins. With a small number of injections this may be negligible, but with a large number of injections it may become quite extensive. This would necessarily increase the back pressure in the veins and consequently make pulmonary emboli more likely. We do not believe it advisable to unnecessarily increase the probability of pulmonary emboli.

Sugar solutions, which are now becoming the most popular for this purpose, must necessarily be used in the form of a rather dense liquid. This requires a comparatively large needle. We have found that the vast majority of patients much prefer to have not more than two or three injections at one time, and to return as often as required. The ultimate results are the same. Also a very extensive thrombosis may be accomplished by two or three injections (Fig. 5). Ten or twelve injections, as advocated and practiced by some men, not only would have been superfluous here but would have been an injustice to the patient.

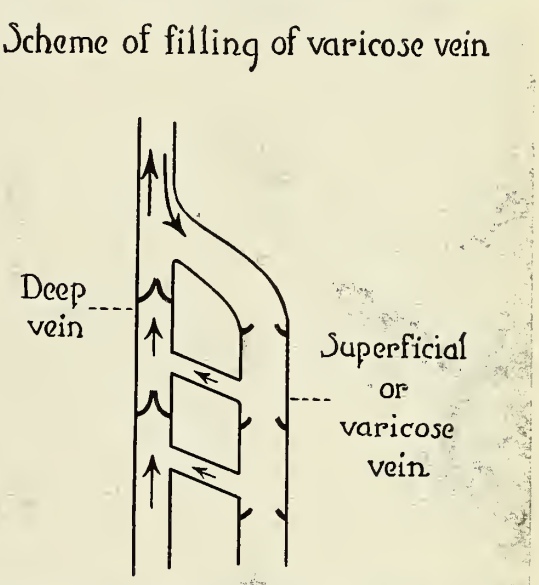


Fig. 4. Shows incompetent valves in varicose vein. Vein fills from above and blood seeps through to deep veins.

The great majority of men throughout the world who are doing this work undoubtedly agree that too many injections should not be given at one session.

TECHNIC

When we began this work in 1922 we were not satisfied with either the technic practiced in Germany or that in France. With the former, the work was difficult to carry out and apparently much time wasted. With the latter, our percentage of thromboses was not as high as we desired

it to be. According to the former, the patient was put in the prone position with the leg raised, the vein emptied by force of gravity, constrictors put on above and below the point of injection,



Fig. 5. This entire vein on right from malleolus to groin was thrombosed by two injections.

and, presumably, the empty vein entered with the hypodermic needle. In our experience, one can be sure he is in the vein only by the aspiration of blood. If the vein is collapsed or the blood all forced out of it previously, how can you aspirate blood? Practically we have found that considerable blood enters this portion of the vein through communicating branches from the deep veins, and we are not getting a collapsed or empty vein, but only increasing the difficulty of entering it.

In injecting the full vein with the patient in the erect position, as practiced in France, our solution is diluted to a degree that it does not give the desired result in a large percentage of cases unless we inject a large amount of solution, thus displacing the blood.

The object here sought is to have the injected solution come in contact with the intima of the vessel in an undiluted form, thus giving the maximum of chemical irritation at this point. The chemical irritation causes necrosis of the intima, as shown in Fig. 3, thus bringing about the desired thrombosis.

The method we have used mostly for several years, we first mentioned in 1924. We have tried every other method that we have observed or have seen described in literature, but have found none so simple or more effective.

We have the patient sit up or stand on the table, usually in the position in which the most marked distention of the vein occurs. We insert the needle into the distended vein, then with the palm of the left hand gently compress the vein over the site of the injection (Fig. 6). Here we are careful to have the pressure extend back of the entering point of the needle so as not to force the fluid back into the perivenous tissue. We are careful not to release the pressure in binding on the pad, as shown in Figure 7. This pad we usually leave on until the following morning and the patient then removes it. For several years we insisted on the patients buying elastic bandages to wear over the entire lower leg during this treatment. We have abandoned this entirely unless the patient chooses to wear one for comfort.

We have tried the various methods on successive days and after one month attempted to distinguish between the results. After some time we concluded there was no method that gave better end-results than this method just described. The method is simple and requires a minimum of apparatus and lost motion.

COMPLICATIONS

The only complications we have observed were perivenitis and slough.

Perivenitis. — Perivenitis, so-called by the French, frequently worries the patient and at first worried us, and especially worried the medical man who by chance saw one of these patients before he was acquainted with this method of treatment. The area for some distance from the point of injection frequently becomes swollen, red, hard, feverish, and quite painful. Fortunately, we can usually truthfully tell the patient that the more marked these symptoms are, the more extensive are the results.

We usually advise hot applications and possibly some mild drug for the pain. Usually this does not give them trouble more than two or three days.

Sloughs.—Sloughs, we must admit, are due to faulty technic, but most of us who have followed this work for any great length of time have had them occur.

With the various sugar solutions, we have had practically no sloughs. With quinine hydrochloride and urethane, sloughs have been almost negligible. Sodium chloride, sodium salicylate and a mixture of dextrose and salt solution have given us our most extensive sloughs. Bichloride of mercury solution always gives a slough when injected perivenously but the slough is usually not so large as that produced by the other solutions just mentioned. If the solution escapes into the perivenous tissues at the time, the patient usually complains immediately of a local burning sensation. If we are in doubt we usually inject a large amount of novocain solution before sterile water. This usually dilutes the solution to such a degree that the slough is prevented. The inevitable slough usually shows up on the day following the injection. There is usually a dark bleb with a dark area underneath.

Treatment of Sloughs.—Usually the slough does not cause very severe pain unless infected. If infected, an Ochsner's pack will clear this up in two days. After four or five days the slough may be cut out to some extent without much pain, keeping within the area of necrotic tissue. We usually pack the cavity with gauze soaked with 1 per cent Dichloramin T. We are always careful to cover the skin with vaseline gauze to prevent irritation. The Dichloramin T usually dissolves away the necrotic tissue. After the necrotic tissue is dissolved away we dust on a little calomel powder and pull the edges of the ulcer together with adhesive.

These sloughs are slow to heal and a source of considerable annoyance to the patient. We hope some time to be able to avoid them.

Ulcers.—Our first work over eight years ago dealt only with patients who had already had ulcerations (Figs. 1 and 2). We then used the Unna cast (Fig. 8) in all cases until the ulcer was healed. We now use it only in the very extensive ulcerations. If the ulcer is not too large we use the sponge pressure method. This gives us more rapid healing than we have observed with any other method.

If there is acute infection in or about the ulcers we put on the Ochsner pack for forty-eight

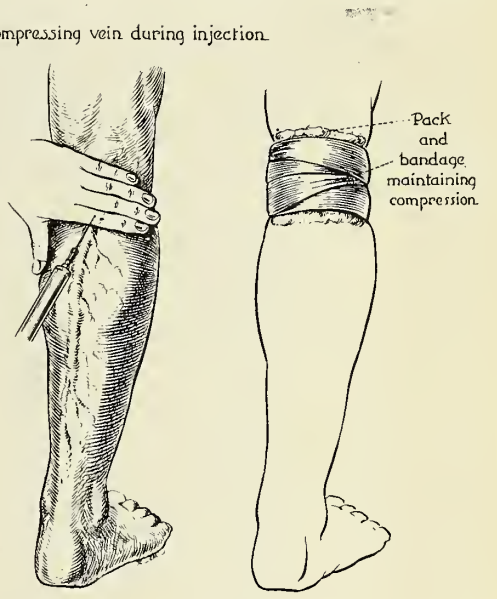


Fig. 6. *(Left)* Shows method of compressing vein to force out the blood during injection.
Fig. 7. *(Right)* Pad bound on to maintain compression following injection.

hours. We then clear away any loose or sloughing tissue. If the granulation tissue protrudes above the epithelium at any point we touch this with a stick of silver nitrate. Silver nitrate should not be used otherwise. We then dust on a very light layer of calomel powder, cover the area with vaseline gauze, and bind the rubber sponge on very firmly. The elasticity of the sponge prevents shutting off of the blood supply below. The pressure forces out the fluid from the edematous area about the ulcer and produces a fairly normal appearing tissue.

We begin injecting the veins as soon as the patient is seen and continue until the varicose veins are all thrombosed. This hastens the healing of the ulcer.

THE TRENDELENBURG TEST

The Trendelenburg test for function of the deep veins is rather confusing as ordinarily described. We were much more concerned about it several years ago than we are now.

The history and general appearance of the leg will usually give one a fairly definite idea as to the function or absence of function of the deep veins. If there is any doubt, one should pro-

ceed slowly. One or two injections will rarely cause any great harm if the deep veins are thrombosed. If there is much swelling or edema after this injection, the work may be discontinued and taken up later. If there has been a recent thrombophlebitis, no injection should be made.



Fig. 8. The Una cast cut and turned back, exposing the healing ulcer.



Fig. 9. Could not demonstrate Trendelenburg test in this patient. Injection treatment gave very good results.

SITE OF INJECTION

If there is an ulcer present, we usually aim to inject the vein in the immediate vicinity of the ulcer first. This will hasten the healing of the ulcer. In other cases we usually select the distal veins first if they are easily accessible; if not, we go higher and the distal may become prominent later. Each injection will ordinarily thrombose about three or four inches of the vein. Occasionally one injection will produce a very extensive thrombosis, possibly throughout the length of the vein (Fig. 5). We usually do not choose a site where the vein is too superficial. Frequently portions of the vein appear through the skin like a blue bleb. These points are usually not chosen for a site of injection. They are difficult to thrombose directly, perhaps because of changes already taking place in the intima. Occasionally a slough will result if the solution is injected directly into this point. If the injection is made at some distance from these points, the thrombosis may extend through them and give good results. We usually do not inject more than three or four inches above the knee except in very superficial veins. In the latter, we sometimes inject above the middle of the thigh.

FREQUENCY OF INJECTIONS

We usually arrange this about as the patient prefers. If the patient is in a hurry we may increase the number of injections at each session. The injections may be made every day, every second day, or once or twice a week, according to the resulting reactions. If the reactions are severe we usually give them a longer interval between injections. If the reactions are slight we do not hesitate to make daily injections.

RECURRENCES

It is frequently difficult to determine late whether canalization of the thrombus has taken

place or a branch previously unnoticed has become dilated. We have seen several patients, who had recently had surgical removal of varicose veins, return in a year or more with very prominent varicose veins. These evidently had not been considered at the time of the operation, but have become practically as troublesome as the original veins.

The same is true with this method, but here the patient will usually return for further treatment while in the case of surgical removal the patient seldom cares to submit to the second operation. In many instances, when the patient was relieved of all symptoms, he failed to return until he again had troublesome symptoms.

We cannot recall a single instance in which we were not able to thrombose the vein, nor have we failed to relieve the symptoms when we were certain they were due to varicose veins. In many instances we have failed to produce a thrombosis with a particular solution, and have resorted to the use of other solutions until the results were obtained. When we have thrombosed the prominent veins and relieved the patient's symptoms, we tell him to discontinue the treatment and return in from one to three months, or sooner if symptoms arise. We have had from 10 to 15 per cent of our patients return for further treatment. Some returned within six months; some returned from one to eight years later. No doubt the canalization of the thrombus had taken place in some cases, but for the most part it seemed that new varicose veins were the cause of the patient's return.

CONCLUSIONS

1. The sclerosing method of disposing of varicose veins has become the method of choice.
2. Many useful solutions have been employed for this purpose, but the ideal solution has not yet been brought out.
3. Practically every active patient, or one who is not disabled by other disease, may have his varicose veins treated by this method if very cautiously done.
4. Emboli do occur. They are rare, but every possible precaution should be taken to avoid them.
5. The most troublesome complication now is the slough. This complication may be reduced to a minimum with extreme care.
6. We have not found any one particular solution applicable in all cases. If good results are not obtained with one, another may give the desired result.
7. The erect or sitting position, entering the vein in a distended condition, and then collapsing it with gentle pressure, is the simplest method. None has proven more effective in our hands.

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AN ANALYSIS OF 100 CONSECUTIVE CASES OF BACK STRAIN*

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Minneapolis

THIS clinical study was undertaken to determine the relative frequency and importance of the various findings in cases of back strain occurring in a private practice limited to diseases and injuries of the bones and joints. The cases were taken consecutively, and analyzed carefully as to history, clinical and x-ray examinations, treatment and results.

INCIDENCE

Sex.—As might be expected, 70 per cent of the back strains occurred in males, due, of course, to their more hazardous occupations and greater muscular activity. While 30 per cent occurred in females, fourteen of these (or nearly one-half) gave no history of external violence. Postural back strains seem to be more common in women, as are strains due to work in the stooping position. In this series only 3 per cent followed parturition.

Age.—Strains of the back occur most frequently in early adult life, which is the period of greatest physical effort. The average age in this series was thirty-one and one-half years, but the range was from seventeen to sixty-six years of age.

ETIOLOGY

Back strains are nearly always considered the result of trauma of some sort, yet in this series 25 per cent gave no history of external violence of any sort! Automobile accidents caused about 25 per cent of these cases, and the strains produced in this manner were usually the more serious. Other accidents of violence, such as occur in industrial or railroad work and the vigorous sports, accounted for 20 per cent. Heavy lifting or slipping while carrying loads caused an additional 10 per cent, while falls alone produced 13 per cent. Trauma, or external violence in the ordinary sense, then, was the etiological factor in 68 per cent of these cases.

Bending or working in a stooped position was considered the cause of the trouble by 6 per cent of these patients, and 3 per cent of them dated the onset back to parturition.

SYMPTOMATOLOGY

All of these patients complained of aching, stiffness or pain in the lower back, and on this account they came for relief. The pain was usually described as diffuse over the lumbosacral region, but occasionally was more definitely limited to the right or left side. Pain radiating down the back of the hip, thigh, or leg, or around into the inguinal region was more rarely mentioned. The specific complaint of stiffness in the back was mentioned by 68 per cent of these patients. It is worth while to ascertain, if possible, what aggravated or relieved the pain. The location, character, and distribution of the pain should be determined so far as possible.

In private practice, however, the examiner must sometimes look askance at subjective complaints relating to the lower back until he learns whether or not there is compensation or litigation pending. In this series 36 per cent of the cases were either involved in compensation claims or were in some way connected with litigation. One tends to evaluate the subjective complaints differently in such cases unless the objective findings seem to agree.

OBJECTIVE FINDINGS

List, or lateral deviation of the spine as a whole, is the first sign noted on examination of the patient. Inspection must include the entire posterior surface of the nude body to be of any value. A list appeared in 23 per cent of these cases (due to a short leg in 2 per cent). The list is usually away from the side complained of, but occasionally is toward the sound side. Smith-Petersen believes that a list results from the patient's attempt to avoid transmission of weight through the affected side, and is due to muscle spasm. This was certainly true in 13 per cent of these cases, but in the additional 10 per cent presenting a list there seemed to be little or no muscle spasm

*Read before the American College of Physicians, Minneapolis, February 14, 1930.

demonstrable. We interpret some of these lists as having a mechanical derangement of one of the small postero-lateral articulations of the lumbo-sacral joints. By this is meant actual overriding of one articular facet on its fellow with locking in the dislocated position,

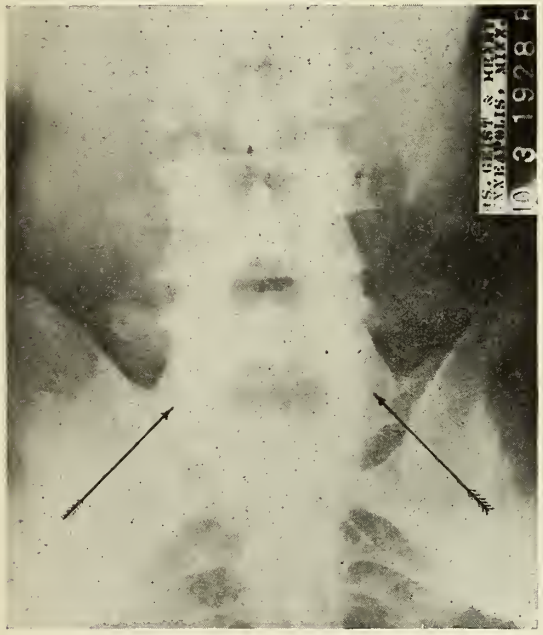


Fig. 1. Normal spine (note position of postero-lateral articulations).

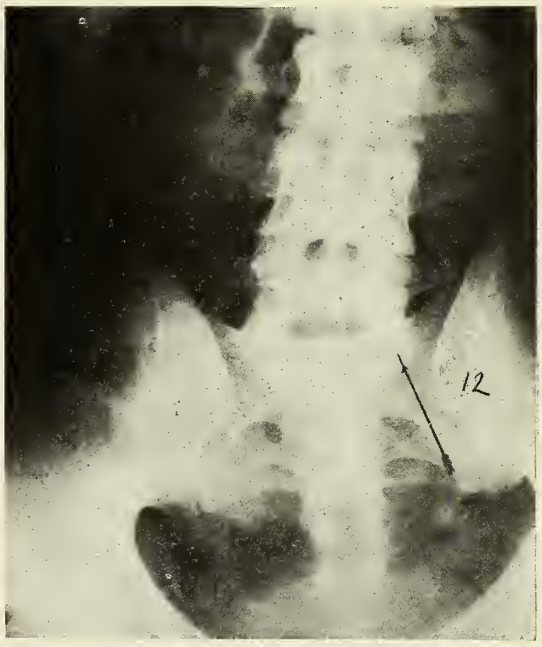


Fig. 2. Unilateral abnormal variation of articulations, with list.

or pinching of the synovia, capsule, or ligaments of the joint in the rebound of these articular surfaces when they have been displaced beyond their normal limits of motion. Such derangements are not demonstrable roentgenologically because these cases always have "abnormally placed" articular facets, that is, the small postero-lateral lumbo-sacral joints are congenitally placed facing antero-posteriorly instead of mesially as is considered "normal" in this region. In this series every patient presenting a list also had so-called "abnormal" articulations, except one patient who had a short leg.

Faulty posture was noted in 20 per cent of these cases; and by this term, we include only Class D postural ratings according to the Boston classification; that is, extreme exaggeration of the normal spinal curves, with flat chests and prominent abdomens. Under this heading, other defects in statics are included as well as deformities, but none of importance obtained in this series except two mild cases of scoliosis. It is interesting to note that postural back strains appeared in women three times as often as in men, and, when appearing in males, the individuals were always of poor muscular development.

Crepitation was definitely present in 4 per cent of the cases. This is always sought for when testing range of motion of the first time. It can usually be palpated over the lumbar region, but is sometimes rough enough to be audible as well. Of course, this finding occurs oftener in older individuals but is sometimes present in younger adults with arthritic tendencies. It is not always found in cases presenting definite spurs and lipping on x-ray, and, on the other hand, may be found in cases having "normal" roentgenograms.

Limited motion is the most important and reliable sign in cases of back strain, and was present in 47 per cent of this series. Range of motion was first checked in flexion, extension, side bending and rotation with the patient standing and not bending his knees. The range of flexion was then re-checked in the sitting position because the muscle spasm often relaxes in the sitting position in sacro-iliac cases. Limited motion is usually due to muscle spasm —reflex splinting to protect the injured parts of the back and prevent pain—but, of course, spondylitis limits motion whether appearing alone or with strain superimposed. In the lat-

ter type of limitation, the x-rays are helpful in disclosing arthritic changes, antecedent fracture, tuberculosis, spondylolisthesis, etc., which conditions per se are not included in this analysis.

Muscle spasm, as a definite objective sign,

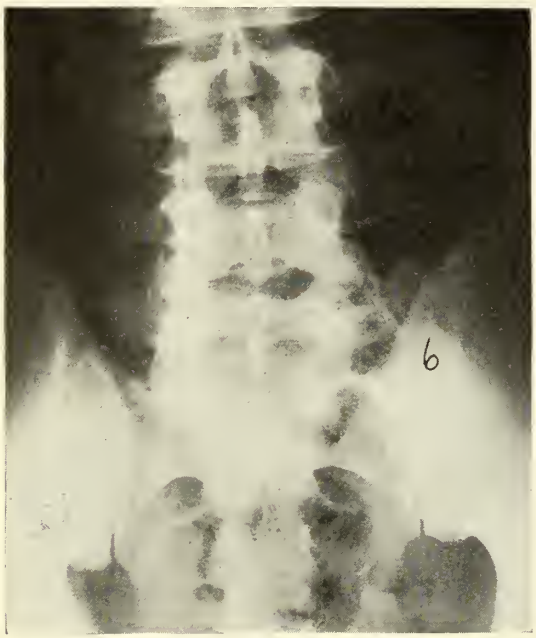


Fig. 3. Unilateral sacralization, with spina bifida occulta.

was present in 16 per cent of these cases. It was undoubtedly present in more of the cases, and accounted for limited motion and list, but was not noted by the examiner. Personally, I often find it difficult to ascertain with certainty in muscular and obese individuals unless supported by limited motion, list, or positive leg signs.

The straight-leg-raising-test was positive on one or both sides in 27 per cent of these cases. This test transmits leverage through the hamstring muscles to the patient's lower spine, and, if applied carefully, it is of great value in demonstrating muscle spasm. As the patient's leg is raised straight from the table, the examiner's other hand should be placed beneath the lower spine, where the reflex spasm can be felt concomitant with the onset of pain before the lumbar spine begins to move. In cases of unilateral sacro-iliac strain, this sign is positive at a lower elevation of the leg on the affected side than on the sound side, while in cases of lumbo-sacral strain, the sign is apt to be positive on both sides at the same elevation. This test is also valuable because it is difficult to simulate if carried out properly and carefully.

The cross-leg-rocking-test is valuable because it confirms information gained by the above tests. In this test, the knee is flexed so that the ankle rests on the opposite knee of the recumbent patient; then downward pressure is simultaneously applied to the flexed knee and the opposite pelvic spine. The psoas muscle and the Y ligament of the hip are thus utilized as a lever to rock the pelvis. Response to the test is complaint of pain, and being a subjective test, this is less reliable. However, the test is valuable because being less frequently employed, it is less frequently simulated. This test was positive, that is, produced complaint of pain, in 19 per cent of this series.

The other leg signs and sacro-iliac tests, such as crest compression, pressure over the symphysis pubis, Ely's sign, Gaenslen's sign, and palpation per rectum, were employed too seldom to be included in this analysis. They are, however, of great value in differentiating lumbo-sacral and sacro-iliac strains.

Tenderness was present in 66 per cent of these cases. As a sign it appeared most frequently, yet is probably of least value unless the examination be systematic and thorough. In palpating for tenderness the patient had best be placed prone over the end of the table so that his legs hang free. This position removes much of the lumbar lordosis and offers better opportunity for identification of bony landmarks. Tenderness is sought first over the sacro-iliac joints, then over the sciatic notch, next over the ilio-lumbar ligaments, next over the spinous processes and interspinous ligaments, and lastly over the dorsum of the sacrum. Points which seem to be sensitive are marked on the skin, and later checked to eliminate simulation.

Short leg presented in 2 per cent of this series, just frequently enough to remind one that measurement of the legs is a part of a complete examination of the back.

X-RAY FINDINGS

Every case in this series was studied with stereoscopic antero-posterior and lateral roentgenograms, and 80 per cent showed some sort

of so-called "congenital abnormality," or anatomic variation.

Abnormally placed postero-lateral articulations appeared in 63 per cent of the cases—too high a percentage to ignore or consider as coincidence. As mentioned above, nearly every patient having a list showed "abnormal" articulations. While the facets of these articulations between the fifth lumbar vertebra and the sacrum are somewhat crescentic, nevertheless the major portion of the articulation faces medially in the normal spine as pointed out by Goldthwait (Fig. 1.) In a large proportion of spines studied roentgenologically these small diarthrodial joints are seen to face more antero-posteriorly, and are called "abnormal," or variations (Fig. 2.) Dickson, Bohart, and others, studying large series of backs roentgenologically, report variations present in 35 to 44 per cent of all spines. In this series of 100 cases diagnosed "back strain," however, the percentage is much higher—63 per cent showing abnormal facets and 80 per cent some congenital variation. This seems adequate basis for reasoning that such backs are either more susceptible to strain, or recover more slowly from the effects of strain.

Sacralization appeared in 5 per cent of this series, either unilaterally or bilaterally. Spines having this variation are inherently weak because of the restriction of motion (Fig. 3.)

Spina bifida occulta occurred in 7 per cent of this series, and lack of fusion of laminae occurred in an additional 3 per cent. Persons having this variation are obviously more susceptible to strains, especially the muscular type, because the membrane closing the defect offers a weaker origin to the muscles arising from it. While spina bifida occulta is one of the commoner congenital variations and does predispose to strains, the injury occurring in these cases usually responds rapidly to treatment.



Fig. 4. Osgood back brace.



Fig. 5. Goldthwait back brace.

Scoliosis of a mild type was revealed by the roentgenogram in 2 per cent of this series. Except as this condition alters the statics of the spine slightly, it does not seem to figure prominently in predisposing to strain.

Sprain fracture appeared in 2 per cent of these cases, as a tiny chip pulled off the anterior margin of the vertebral body.

Arthritic changes were revealed by x-ray in 5 per cent of these cases. Insurance companies know this to be one of the most bothersome findings. "Pre-existing dormant arthritis, aggravated by injury" has become a common expression.

Antecedent disease such as healed tubercu-

losis, or healed fracture, was found in 8 per cent of these cases, a large enough proportion to suggest that the fusion of even a small portion of the spine constitutes a permanent disability which may slightly predispose to subsequent injury.



Fig. 6. Plaster-of-Paris jacket. (Note felt pad for axilla.)

TREATMENT

The various forms of treatment are applicable to widely different types of cases, and consequently the methods employed require explanation only in general.

Physiotherapy was employed in all of these cases either by the patient himself or a trained physiotherapist. Local heat, either by electric pad, radiant light, or hot packs was usually applied. Baking and massage was given in many cases, but none of this series happened to receive diathermia. We believe diathermia of great value in acute strains of all sorts, and find it of great value for relief of pain in such cases.

Rest alone (or supplemented by no other treatment than adhesive strapping) was used in 6 per cent of these cases. By this is meant absolute rest in bed, usually with pillows supporting the knees to relax the hamstring muscles. All of these patients, however, were instructed to avoid bending, stooping, and lifting during the period of treatment, and usually were cautioned to avoid the jolting of vehicles.

Foreign Protein Injections were employed in 2 per cent of the cases. This is done in those special cases where the arthritic habitus of the patient seems to warrant such treatment. It is always carried out in a hospital by a competent internist. In both of these cases this treatment seemed beneficial, but not entirely curative.

Correction of short leg was used in 2 per cent of the cases. The correction employed is a one-half inch lift on the outside heel of the shoe, adding the remainder necessary for correction by an inner heel. If the difference in length is more than three inches a high sole is employed.

Postural correction was given in 12 per cent of the series. Correct mechanical use of the body was explained to the patient; postural rests and corrective exercises were given. Some of these cases were recorded at the first visit with the Schematograph, and later gracings made from time to time to check progress.

Braces were used in 61 per cent of these cases. The type of brace varied from the leather sacro-iliac belt having perineal straps, to the Osgood, or "butterfly," brace having axillary crutches to take the weight on the iliac crests (Fig. 4). The brace most frequently used was the spring steel brace of the "Boston" or Goldthwait type (Fig. 5.) This is a highly efficient brace for the ordinary case, being quite comfortable if properly fitted.

Plaster of Paris jackets for more complete and certain immobilization, were employed in 8 per cent of these cases. Usually they were applied after manipulation under anesthesia and were worn during the period of rest in bed and after the patient was ambulatory. For cases of back strain they are always applied with the patient supine on the Goldthwait irons. Only very little padding can be used if jackets are to be efficient—just enough to protect bony prominences and not interfere with accurate fitting (Fig. 6).

Manipulation under anesthesia was used in 10 per cent of these cases. Ethylene anesthesia was employed, and only those cases having a list with possible mechanical derangements of joints were manipulated. We attempt to carry the spine through the normal range of motion with the muscle spasm relaxed by anesthesia.

The straight leg raising of Baer is used to flex the pelvis on the spine. This is not an exact method of treatment, but we have had no untoward results, and some brilliant results.

The operation of spinal fusion was done in 4 per cent of these cases. Naturally it is done only in severe, chronic cases, after all other forms of treatment have failed. The exact type of operation used is a modified Hibbs' operation, to be reported shortly. Usually the last three lumbar vertebrae are fused to the sacrum (in lumbo-sacral cases, no sacro-iliac fusion appeared in this series (Figs. 7 and 8). The results have been satisfactory to the patients in all of these cases thus far.

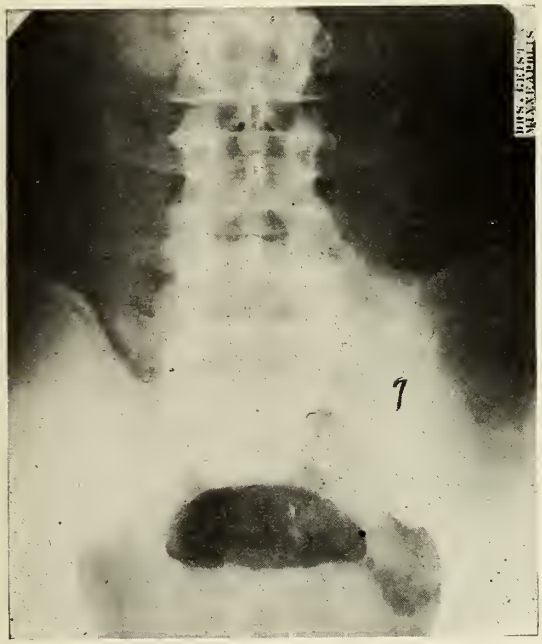


Fig. 7. Post-operative spine (in unilateral sacralization). (Same case as Fig. 3.)

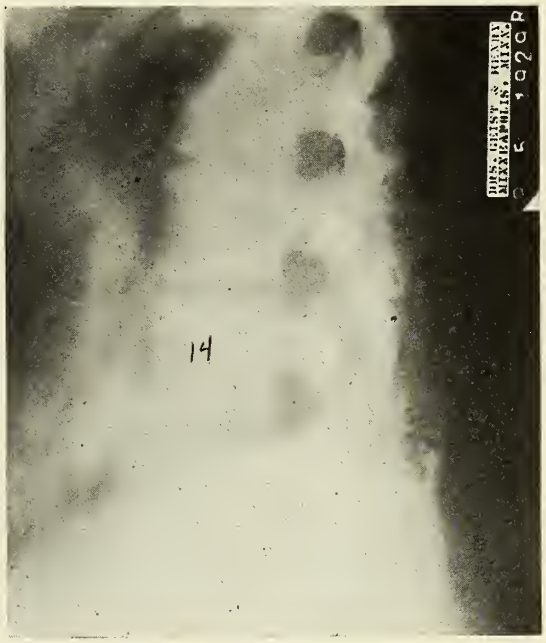


Fig. 8. Post-operative spine (note new bone formation 6 months post-operative).

RESULTS

An analysis of the results in these cases seemed at first disheartening, for the end results were unknown in 29 per cent. Many of these were patients involved in litigation, however, who were unable to utilize our report of opinion on their condition as they had anticipated. Undoubtedly, some of this unknown group sought relief elsewhere or were perhaps disgruntled or dissatisfied with the treatment received. Some of them were referred to charitable institutions, and some have moved.

In 71 per cent, however, the end results are at hand. Of these, 4 per cent are definitely unimproved to date. In two of these the condition seems to be recurrent, depending either upon the exigencies of their work or play.

At their last office visit 30 per cent of this series reported improvement but not complete cure. We believe that this group improved sufficiently later.

At their last office visit the remaining 30 per cent reported complete relief from their trouble.

SUMMARY

1. An analysis of 100 consecutive cases of back strain is given and a summary of the physical findings is appended herewith.
2. Back strains are most common in early adult life, and are usually due to external violence, although 25 per cent of this series gave no history of trauma.
3. A "list" of the spine is a very reliable sign, and is due to muscle spasm or mechanical derangement in anatomic variations of the lumbo-sacral joints.
4. Limitation of motion of the back, and the "leg signs," are valuable aids in diagnosis.
5. Congenital anomalies appeared in 80 per cent of the series, indicating that such backs are predisposed to strain.
6. Most cases were relieved by rest or mechanical support and fixation, although several required fusion operations to gain permanent relief.

CASE REPORTS

A CASE OF MYXEDEMA AND DIABETES*

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The combination in one person of myxedema and diabetes mellitus is apparently quite rare. Only four cases have been reported in the literature to date. One case was reported by Wilder,[1] in a child; one by Jamieson[2]; and two by Wright.[3] It is interesting to note that all of these patients either had the diabetes first, and subsequently developed myxedema, or the two conditions occurred simultaneously. In the case reported in this paper, the myxedema antedated the diabetes by six years.

Wilder's case was that of a child who had diabetes at the age of 15 months, and who subsequently became myxedematous at three years of age. The diabetes had been under very careful control, but when an attempt was made to raise the low metabolic rate, consequent to the myxedema, by the use of thyroid substance, the diabetes became more marked. But when thyroid substance was discontinued, in order to control the diabetes, myxedema symptoms returned.

This also seems to have been the experience of the other men who reported three cases, all of which concerned adult patients. Jamieson's case had a history of diabetes antedating the onset of myxedema symptoms, but when first seen and examined, both conditions were found to be present. The original sugar tolerance curve was fasting .131, 3 hours, .185. After 13 days, thyroid medication brought the original low basal metabolic rating up to normal; the sugar tolerance had diminished, *i.e.,* fasting .284, 3 hours, .343. Thyroid was discontinued for one week and the curve still remained high, .254 and .349 in 3 hours with a basal metabolic rate of —11%. Thyroid was further withheld for one month, reducing the basal metabolic rate to —41%, and the fasting blood sugar then had reduced to .192. A standardized procedure of diet, insulin and small doses of thyroid was then agreed upon; the attempt being made to keep the metabolic rate moderately low, and the blood sugar within reasonable bounds.

Wright's cases, also adult patients, are quite similar. In both cases the individuals had diabetes before the onset of evident myxedema. After the establishment of the myxedema, the diabetes was much more difficult to control, as Jamieson's and Wilder's experiences revealed.

REPORT OF CASE

A. W. S., male, aged 44 years, appeared for examination June 28, 1927, complaining of weakness, aching legs, and shortness of breath. He stated that in March, 1920, he began to feel general malaise, was easily fatigued, and had some aching of legs and dyspnea on exertion. He had been treated for pyorrhea at that time without relief of symptoms. Upon questioning it was brought out that he had suffered from impairment of visual acuity; his mental processes were considerably retarded; and his hearing, especially, had become quite poor. He found it almost impossible to keep awake, and would usually fall asleep anywhere if he remained in a sitting position for any length of time. He had gradually gained in weight, and his flesh had become soft. He had become stooped, and "round shouldered" during the past year, and experienced great difficulty in holding his head erect. His hair had become dry and had fallen out; his skin was dry, although he perspired readily. There had been some swelling of the legs from the knees down, which did not vary greatly on change of posture. His wife further stated that his pulse had become slow, being about 50 when she had counted it. The family and past history was unimportant. He had two children, and his wife had had two miscarriages, both at about six weeks.

Examination revealed a dry, scaling skin, thin dry hair, and scaly scalp. The face was puffy, especially around the eyes, and the color was rather pale. General musculature was flabby, with an increase of fat deposit at the back of the neck and on the abdomen. The pulse was slow (50-56), full in volume, but of low tension. Respiration was also slow. As the individual was questioned, his attention wandered; his speech was slow and thick, and his answers were often inaccurate when checked by his wife. The eyes were negative, except for a drooping of the upper lids. The examination as to heart, lungs, abdomen, was entirely negative. The reflexes in the extremities were sluggish. There was no true edema, but a typical myxedematous palpatory sensation of the subcutaneous tissue was present. The first blood pressure reading was 108/80. Important laboratory findings at this original examination were, a negative urine, a negative blood Wassermann, and basal metabolic rate of —36 per cent. He was placed on 6 gr. of dessicated thyroid substance daily, and his subsequent course can be readily seen by the accompanying chart. There was the expected symptomatic improvement, and from 1922 to 1928 he was not seen, although we corresponded with him at intervals.

During the winter of 1927, he developed symptoms of diabetes, that is, he lost weight rapidly, had great hunger, thirst, and weakness. The doctor in the town to which he had moved found sugar in his urine. There was great difficulty in establishing a proper balance between diet, glycosuria and thyroid dosage. Finally, in August of 1928, he returned to the Clinic for examination and management. At this time he was found to be thinner than before, and without any sign

*From the Department of Medicine of the Nicollet Clinic. Read before the Minnesota Society Internal Medicine, May 26, 1930.

or symptoms which one could identify as being myxedematous. His pulse rate was slow, his blood pressure 120/80, and his basal metabolic rate was —17 per cent. Again his course can best be followed by reference to the accompanying chart.

At the present time, the patient is not very coöperative, and insists upon an adequate daily food intake as he must continue his work as janitor. He will not report at regular intervals for checking up, but usually comes in when either he or his wife are worried about something.

Date	Basal Metabolic Rate Per cent	Wt. Kg.	Blood Sugar Per cent	24 hour urine sugar gram	Thyroid substance per day gram	Insulin Units Per Day	Diet
6/29/21	—36	75.8			6		General
10/ 3/21	—6	66.0			4-6		
4/ 3/22	+2	76.4			4-6		
8/28/28	—17	70.0	.174		4	15	Carbohydrate, 110 Protein, 70 Fat, 180
9/ 1/28				33	2	30	
9/14/28	+27	66.0		4	2	30	
10/ 5/28				3	2	30	
10/18/28	+7	69.0			2	30	
12/20/28	+12	67.0		13	2	30	
7/17/29	+1	58.0	.285		2	30	
3/31/30	+11	60.0	.222		2	30	
4/ 4/30				8	2	35	

Chart indicating patient's condition.

We have tried to eliminate the thyroid substance, thinking that perhaps the diabetes might be better controlled if we allowed the basal metabolic rate to drop to 10 or 15 below normal. The patient, however, has a great fear of relapsing into his previous lethargic state, and insists upon taking a small daily dose of the substance. During the time when he was first found to have diabetes, he had a few unfortunate insulin reactions, and has developed some fear of an over dosage of it. Perhaps, due to the peculiar combination of things, in this case, these personal factors are not very important, but they are recorded as a possible explanation for the difficulty in controlling the diabetic factor. If the basal metabolic rate could be allowed to drop below normal, and the man would consent to either limiting his food intake, or increasing his insulin dosage, perhaps the balance could be better maintained.

DISCUSSION

According to Joslin and others, diabetic patients when first seen usually present an increased basal metabolic state, about +20 per cent being average. This rate is generally reduced to —10 per cent or so after the patient is placed upon proper dietary management. It has been thought that this reaction is no more than a chemical metabolic effect of food.

Wilder has stated that the presence of the exophthalmic goitre syndrome reduces the ability of the diabetic individual to utilize carbohydrate, decreases the efficiency of a unit of insulin, and increases the danger of sudden onset of diabetic coma, while the control of the hyperthyroidism by iodine markedly improves the carbohydrate tolerance. These deductions, based upon observation of the behavior of diabetics with hyperthyroidism, must be applied to our present problem.

Fitz[4] had already found that a non-toxic goiter had no influence upon diabetes. Holst[5] has seen a diabetic condition occur after thyroidectomy on an exophthalmic goiter during a remission. Two and one-half years later this same patient became myxedematous, and the diabetes cleared up. Wilder[1] further states that there are numerous instances of myxedema occurring in diabetes, resulting in an improvement of the carbohydrate tolerance, but he does not state any specific cases other than those already mentioned, nor does he give further references. All of which seems to indicate that with low metabolic rate, the tissue cells are able to utilize a given amount of glucose with less insulin than they require when the metabolism is pitched at a higher rate.

Gardiner-Hill, Brett, and Smith[6] give blood sugar curves in 15 myxedema patients which are seen to reach a higher peak and to be more greatly prolonged than normal. In spite of this, glycosuria was rare in their studies. In general, the fasting blood sugar was normal. Thyroid extract given to these patients did not raise the fasting blood sugar, and the general effect on the curve itself was to lower the peak and quicken or shorten the curve.

Janney and Isaacson[7] found that the fasting blood sugar could be reduced in animals by removing the thyroid from them. Gray[8] found low blood sugar values in 8 cases of myxedema. Other authors quoted by these men confirm the same findings.

In conclusion it must be evident that when diabetes is present in an individual who has a low metabolic rate, one who is, in other words, myxedematous, the raising of that low rate by thyroid substance produces the same result upon the diabetes as occurs when a diabetic patient with a normal basal metabolic rate develops hyperthyroidism. What has not been evident before, but which seems to be brought out in the case presented, is that the presence of the diabetes also does something to the myxedma, that is, less thyroid substance is needed to maintain a normal metabolic rate after the onset of the diabetes than was necessary before.

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RETROPERITONEAL HERNIA

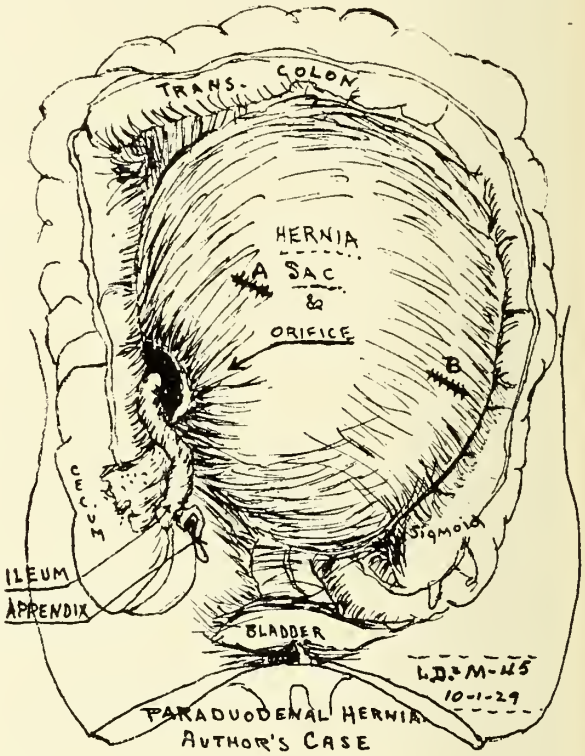
REPORT OF CASE

Fred H. Stangl, M.D.
St. Cloud, Minnesota

An investigation of the literature reveals that the incidence of retroperitoneal hernia is relatively rare, and that to date the total number of reported cases does not much exceed two hundred. These herniae may be divided into four groups, namely, duodenal, pericecal, intersigmoid and those through the foramen of Winslow.

The hernia here reported is of the paraduodenal type, which is the most common. This hernia was encountered in the course of a postmortem examination made for the purpose of locating bullet wounds of the abdomen. The individual was a forty-five year old male laborer who had never had any complaints which were referable to the presence of the hernia. Death resulted from bullet wounds of the abdomen which had caused shock, hemorrhage and peritonitis. A surgical repair had been attempted soon after the wounds had been inflicted but only the hernia sac had been sutured, the impression, according to the surgeon, being that the sac was hemorrhagic distended bowel.

At necropsy, when the abdomen was opened, it was found entirely void of small intestines and the major portion of the abdominal cavity was occupied by the large tumor mass as shown in the accompanying illustration. The membrane covering the herniated small intestines was neither transparent nor translucent and was made up of dense fibrous tissue from 5 to 7 mm. thick. When the cecum was pulled laterally, a small



portion of the distal ileum was found which coursed upward from the ileocecal valve to enter an orifice just at the side of the cecum about half way between the caput coli and the liver. Two recently catgut-sutured defects in the anterior hernia wall were encountered at the sites indicated by "A" and "B" in the illustration. Within the hernia sac the small intestines were much matted together by old fibrous adhesions and there was everywhere present much bowel content, dark purple fluid and clotted blood, and fibrino-pus. Several large lacerations were present in the loops of small intestine from which the content had escaped and where the hemorrhage had occurred.

EKA SALT AND THE SALT FREE DIET

Eka salt (claimed to contain sodium malate as its essential constituent) is offered as a means of giving the same flavor as common table salt without making it necessary for the body to deal with the ten or fifteen grams of sodium chloride that would ordinarily be taken. Since no one knows whether the sodium or the chloride is responsible for any of the untoward effects attributed to sodium chloride, it would not be proper to include Eka salt in a diet that is intended to be strictly salt free. (Jour. A. M. A., June 7, 1930, p. 1859.)

YEAST

Yeast has so uncertain a laxative effect that it is hardly justifiable to class it among the cathartics. It might more appropriately find a place among the laxative diet factors alongside bran, honey and prunes. Its content of vitamin B makes it of specific value in skin cruptions due to vitamin B deficiency, such as those occurring in pellagra. That it is of much value in other skin troubles, such as acne or furunculosis, is doubtful. The history of yeast suggests that it has a therapeutic value, but that this value is slight indeed. (Jour. A. M. A., June 14, 1930, p. 1939.)

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

CAREL LABORATORIES
Alpha-Naphco

ELI LILLY & Co.
Ampoules Glucose (Dextrose, U.S.P.) Lilly 50 Gm., 100 c.c.

MALTBIE CHEMICAL Co.
Ephedrine Nasal Jelly-Maltbie

MEAD JOHNSON & Co.
Mead's 5 D Cod Liver Oil with Viosterol

MERCK & Co., INC.
Pyridium
Aqueous Solution of Pyridium, 1 per cent
Pyridium Tablets, 0.1 Gm.
Pyridium Ointment, 10 per cent

H. A. MATZ LABORATORIES, INC.
Elixir of Pyramidon
Pyramidon Tablets, 1½ grains

NATIONAL DRUG Co.
Ragweed Pollen Antigen-National
Timothy Pollen Antigen-National

PARKE, DAVIS & Co.
Ephedrine Hydrochloride-P. D. & Co.
Capsules Ephedrine Hydrochloride-P. D. & Co., ⅜ grain
Capsules Ephedrine Hydrochloride-P. D. & Co., ¾ grain
Parke, Davis & Company's Cod Liver Oil with Viosterol 5 D
Thio-Bismol
Ampoules of Thio-Bismol

PITMAN-MOORE Co.
Siomine Capsules, ½ grain, 1 grain, 2 grains, 5 grains

SANDOZ CHEMICAL WORKS, INC.
Scillaren
Tablets Scillaren
Solution Scillaren
Scillaren-B
Ampules Scillaren-B

G. D. SEARLE & Co.
Ampules Mercurochrome-H. W. & D., 1%, 10 c.c. and 20 c.c.

NONPROPRIETARY ARTICLE
Alphanaphthol

TRUTH ABOUT MEDICINES

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Nouron (Nouron Products Corporation, New York).—The ingredients used in the manufacture are soy beans, whole wheat flour and egg yolk. It is claimed to be a nutritious, digestible and palatable food prepared especially for assisting in the gradual change from a liquid to a solid diet, as for weaning babies and for convalescents.

Merrell-Soule Whole Lactic Acid Milk Powder (Merrell-Soule Co., Inc., New York).—It is made from fresh whole milk. It contains fat, 28 per cent; protein, 26.5 per cent; lactose, 32.5 per cent; mineral matter, 6 per cent; total acidity, 5 per cent; free lactic acid, 4.25 per cent; moisture, 2.25 per cent. It is prepared from pure whole milk inoculated with a culture of *Streptococcus lactis.* This product is claimed to have the value of freshly prepared lactic acid milk.

Jell-O (The Jell-O Co., Inc., Le Roy, N. Y., General Food Corporation, Successor).—A mixture of pure gelatin, cane sugar, pure fruit flavor, fruit acid from grapes and vegetable color.

Carnation Milk (Carnation Milk Products Company).—Cow's milk reduced to consistency of cream by evaporating in vacuum and then sterilizing. It contains the vitamins that any cooked milk is depended on to supply.

New Oata (Ralston Purina Co., St. Louis).—It contains rolled oats and precooked rolled wheat. It is claimed to provide iron, phosphorus and the constituents of these grains in a form permitting rapid cooking.

Purina Whole Wheat Flour (Ralston Purina Co., St. Louis).—It is composed of whole wheat. It is claimed that the product is rich in iron, phosphorus and other minerals.

Checker-Corn Flakes (Ralston Purina Co., St. Louis).—It is claimed to provide flavor and variety appealing to the appetite.

Ralston Wheat Flakes (Ralston Purina Co., St. Louis).—It is composed of whole wheat, claimed to provide nourishing food in appetizing form.

Ralston (The Whole Wheat Cereal) (Ralston Purina Co., St. Louis).—It is choice hard winter wheat, containing the wheat embryo, with its vitamins. It is claimed that the whole wheat berry supplies the elements for healthy growth. (Jour. A. M. A., June 14, 1930, p. 1919.)

MODILAC NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Modilac is the proprietary name under which the Wm. S. Merrell Co. markets a compressed tablet containing milk sugar and some salts, recommended for the "humanizing" of cow's milk to render it suitable for infant feeding. In 1925 the Council held Modilac not to be within the scope of New and Non-official Remedies because no medicinal claims were made for it, and included the product in the list of exempted articles. From an examination of the present advertising it appears that medicinal claims are now being made for the product, thus bringing it within the scope of New and Non-official Remedies. These claims were found to be unacceptable and therefore the Council voted that the exemption of Modilac be rescinded and that it be considered unacceptable for New and Non-official Remedies because it is an unscientific mixture of official articles marketed under a nondescriptive proprietary name and with unwarranted therapeutic claims. (Jour. A. M. A., March 8, 1930, p. 716.)

President's Letter

THE big state meeting has come and gone. All who took an active part in contributing to its success are, we may be sure, glad of the chance to relax. They are thinking, quite in unison with everyone else, that this is vacation time, the good old summer time.

Doctors need periods of relaxation and recreation rather more, perhaps, than people in other fields of work, for their responsibilities are more numerous, more direct, and the tension under which they live is greater than is the case in most other callings. Few people realize that the doctor is something of a prisoner with many wardens, to each of whom he is responsible. Never may he be out of reach; always he must be subject to call. The feeling of being tethered makes him long for vacation freedom. His thoughts at this season instinctively turn, in spirit if not in fact, to that first of all great anglers, Izaak Walton.

Occasionally a babe is born into the world whose name is destined to live in the minds of posterity over long periods of time. Some of such are remembered because of the exercise of great power, usually in connection with affairs of state, exercised for weal or woe. Others are remembered because of contributions to science or discovery, or because of unusual philosophical genius. The ones who are remembered best and longest are they who have contributed notably to the real betterment and happiness of mankind.

We all contribute something to life as we journey through, but he whose name endures over the brief span of one hundred years is an exception. Therefore when we find a name that has lived upwards of three centuries it arouses our interest.

The name of Walton comes to mind again in this connection. He was born in the last decade of the 16th century and he lived to the ripe old age of ninety years. He appears to have been a man of considerable acumen, for he was able to retire from gainful work at the age of fifty-one. Thereafter he devoted much of his time to fishing and some of it to writing. Evidently he was not a very ambitious man, as we would define that term today. The few biographies he wrote, of his contemporaries, would hardly entitle him to lasting fame, yet his name endures, due, no doubt, to his one masterpiece, "The Compleat Angler, or The Contemplative Man's Recreation." As we read this book we learn, without realizing it, to know what kind of man he was. We come to feel intimately acquainted with him, and with his fish, and with the scenes of his activities. We feel the warmth of a sunny disposition. He knew the value of rest and recreation, of time used for cultural purposes. He loved beauty, and he enjoyed life in the truest sense. The message he gave to posterity was one of beautiful pen pictures of natural scenes, a quaint philosophy of simple life, the joy of friendly conversation, the value of earnest endeavor and the importance of happy understanding.

This celebrated fisherman would have made a great doctor, for he knew the needs of both body and mind and he understood the yearnings of the human heart. He loved to meditate and he was truly a great philosopher. We doctors may well turn to him to learn something of how to fill our lives, and the lives of others, with happiness.

This is vacation time and we continue to go about our accustomed work, fettered by duty. We all should heed the message his voice is whispering across three hundred years of time: "Go fishing! And learn to be a philosopher."

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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ETIOLOGY OF THE COMMON COLD

Newspapers have announced that J. A. F. Pfeiffer of the University of Maryland School of Medicine has discovered the cause of the common cold. Before this announcement Dr. Pfeiffer had written two short preliminary reports[2, 3] on an organism that he believed to be the cause of colds. It seems likely that the notice in the newspapers is concerned with the same organism. If so, it is a Gram-positive coccus with cultural characteristics that distinguish it from other cocci. It is said to produce colds in man and animals experimentally, to cause fixation of complement in high dilution, and to produce immunity through vaccination.

It should be pointed out, however, that even though one organism can be shown to produce the symptoms of the common cold, other organisms may, also, produce them. There are strong reasons for believing that the common cold represents merely a non-specific reaction to infection of the nasal mucosa with a number of different organisms. Among the reasons for holding this view are several facts. Different symptoms accompany different epidemics of colds. One may be characterized by headache, another by extreme prostration, another by earache, and still others by bronchitis or neuritis. The complications may vary similarly. One season brings infection of the mastoid processes, another, disease of the nasal sinuses, and another, albuminuria. Perhaps the strongest argument for multiple origin is to be found in the results of bacteriologic examination of the complicating lesions. For instance, otitis media complicating colds in the head may yield pure cultures of streptococci, pneumococci, Friedlander's bacilli or any one of several other organisms. The predominating organisms in colds have been studied in different seasons and in different places. They vary markedly.[1, 4] The nasal mucosa may be infected by the organisms of diphtheria, scarlet fever, measles, influenza and epidemic meningitis. Were it not for symptoms elsewhere in the body, these serious illnesses would be only severe colds. Conjunctivitis may be caused by the streptococcus, the pneumococcus, the staphylococcus, corynebacteria, the Koch-Weeks bacillus and the Morax-Axenfeld organism. It scarcely seems reasonable to suppose that the milder nasal infections are all caused by a single coccus.

If Pfeiffer has discovered the only cause for the common cold, he has made one of the most notable discoveries in modern medicine. If his organism proves to be only one of the causes, nevertheless he has made a valuable contribution.

ANDERSON C. HILDING, M.D.

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SAVING THE TAXPAYERS

"When a hospital is owned and operated by government and supported by taxation, to which the medical profession contributes its due proportion, medical attendance should be paid for by taxation, along with all the other facilities supplied by the institution."

The above quotation from the address of the President-elect of the American Medical Association, Dr. William Gerry Morgan, at the Detroit session, seems reasonable. The precedent, however, seems to have been established that physicians donate their services to state and city tax supported institutions and consider the time and effort donated fully compensated by the increased experience gained. Whether the profession in any locality decides to act on the suggestion quoted above and to cease donating its services, depends on the feeling of the physicians in any particular locality.

In an effort to lighten the load of hospital maintenance to taxpayers, certain city and state hospitals in Minnesota have added the part-pay system whereby the patient pays for his hospital care at a rate commensurate with his ability to pay. The rate varies from $4.00 per week up. The services of the staff physician are thus donated to an additional group of patients who can only pay for hospital care or some fraction thereof. This group is one that is likely to grow and in certain instances has grown to such an extent as to add considerable to the sum total of patients treated gratis.

Not to seem penurious we fail to see why physicians should extend their charity to include the part-pay hospital patient in order to save the taxpayers (physicians included) what amounts to thousands of dollars annually.

There are other phases of the situation which lead only to confusion. The part-pay patient's stay in hospital is a matter of financial concern to him, a matter which the attending physician is likely to overlook. His next-door neighbor is receiving the same hospital care at no cost.

The distinction between the indigent patient and the pay patient should be sharply drawn. The matter should be taken up by the local medical society unit concerned, as the continuation of the practice lies in its hands.

PREVENTIVE INOCULATION AGAINST DISEASE

The progress in the immunization against disease has been made so rapidly that it is well to take stock and determine what procedures have been definitely proven of value, what measures are still in the experimental stage, and what measures that promised well have been definitely abandoned.

In any program of this character it is important to emphasize that the prevention of smallpox by vaccination is still the outstanding contribution in this field. Vaccination alone accounts for the fact that we no longer have smallpox constantly in our midst and by vaccination alone can we continue this state of affairs. All infants should be vaccinated between the sixth and twelfth month of life and this should be repeated every five to seven years thereafter. The vaccination should be done by pin prick, then a drop of vaccine placed in the skin, then wiped off and no covering or bandage of any kind applied.

Second only to smallpox have been the results obtained by the preventive inoculation against diphtheria. Diphtheria antitoxin is administered to neutralize the toxin formed by the bacillus in the body of the patient. It has a restricted use for temporarily protecting susceptibles in close contact with the disease. This passive immunity is temporary and does not last over three weeks.

By means of the Schick test, it is possible to determine susceptibility to diphtheria. When the individual is immune a small amount of diphtheria toxin introduced into the skin produces no reaction and the skin appears normal after one week. When the individual is susceptible there remains one week after inoculation a definite red scaling area and often indurated. An immune mother transmits to her offspring sufficient antitoxin to protect it for a number of months, after which period practically all infants are suscep-

tible. As the number of deaths from diphtheria are greatest in the early years of life, it is very important that preventive diphtheria inoculation be carried out before the end of the first year of life. By giving three inoculations of diphtheria toxoid (which is a modified toxin), at intervals of two weeks, from 95 to 98 per cent of susceptible individuals are protected against diphtheria. The use of toxoid in place of toxin-antitoxin does away with the danger of sensitizing the child to horse serum.

Vaccination against smallpox and immunization against diphtheria are so well recognized as preventive procedures that it is as much the duty of a doctor to protect his patients against these two diseases as it is to treat a patient sick with pneumonia or nephritis.

More recently the cause of scarlet fever has been discovered and the toxin producing the rash and toxic symptoms demonstrated. The toxin is produced in the throat of the patient by the streptococcus scarlatinæ. By immunization of horses with this organism and its toxins an immune serum (antitoxin) has been produced which, if given in the early stages of scarlet fever, has a striking curative affect. By the use of this antitoxin the mortality in severe scarlet fever has been very definitely reduced. The incidence of scarlet fever in susceptible individuals is so low that antitoxin should not be used to prevent the disease, but used only in severe cases of the disease.

In determining susceptibility to scarlet fever, the soluble toxin, produced by the streptococcus scarlatinæ grown in plain broth, is used. A small amount is injected into the skin just as in the Schick test. A red indurated area after 24 hours usually indicates susceptibility to the disease and no reaction usually indicates immunity to the disease. The negative test in the newborn infant is not dependent on antitoxin transmitted from its mother as in diphtheria.

For temporarily immunizing the inmates of an institution or school to prevent the spread of scarlet fever active immunization has been successful.

Until a longer interval has elapsed and we can be sure of the permanence of the immunity, it does not seem advisable to recommend the use of active immunization against scarlet fever as a public health measure.

Up to the present time the cause of measles is not definitely known; whether it be a streptococcus or filterable virus is still an open question. Degwitz has shown that if 5 c.c. of the blood serum of a patient who has recently recovered from measles is injected into a susceptible individual not more than four days after exposure to measles, the patient will be protected against measles for a period of about three weeks. If a boy is injected on the day that his sister comes down with the measles he is protected against the disease provided this is the only source of exposure. The same result can often be achieved with 10 to 15 c.c. of serum from any adult who has had measles. More recently the procedure has been changed in an attempt to modify rather than prevent measles. The resulting mild case of measles brings permanent immunity. Although it is not always possible to determine the exact time of exposure, the ideal time to give the serum is from six to seven days after exposure. It is of particular importance in preventing measles in the pre-school period. If the older brother or sister has come down with the disease, the right time to immunize the younger children is usually from one to two days after the measles rash breaks out in the older child.

The disease which, at present, is most difficult to control is whooping cough. Immunization against the disease and therapeutic infection with the Bordet Gengou bacillus has been extensively advised. The result must still be put in the not proven class. Some recent carefully controlled work does not indicate that either the prophylactic or the therapeutic injection is of any great value.

H. F. Helmholz, M.D.

THE SALE OF SUNSHINE LAMPS TO THE PUBLIC

The Council on Physical Therapy has taken the stand that a sunshine lamp sold directly to the public should be so constructed that the radiant energy emitted shall not differ essentially from sunlight. Furthermore, the advertising and descriptive matter pertaining to such lamps should contain no curative claims nor mention of specific diseases. The Council believes that the advertising should be more conservative: it is not convinced that human beings in health require the great amount of ultraviolet energy one is lead to believe is the case from the advertising pertaining to some of the so-called sunlamps sold to the public. (Jour. A. M. A., June 14, 1930, p. 1918.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Medical Statesmen

Is the doctor alive to his great need for aggressive, organized action? Is he ready to assume the leadership for which he alone is qualified to take the responsibility?

The 1930 meeting of the House of Delegates of the Minnesota State Medical Association indicates that the doctor in his organization is indubitably becoming statesman as well as healer and diplomat as well as researcher.

Veterans' legislation, public health, economic tendencies, as they affect the question of caring for the sick; the protection of the layman from the unscrupulous machinations of quacks, of defenseless students against fraudulent educational enterprises; the workings of the courts as they relate to the mental and physical health of offenders within their jurisdiction, health education by newspaper, radio and speakers—all these concerned the 56 members of the House of Delegates at the 1930 meeting as intimately and vitally, apparently as the traditional and special business of the profession.

Following are some of the interesting medico-humanitarian suggestions made by doctors for doctors on the floor of the House, and the men who made them.

Dr. C. B. Wright, Minneapolis: "While the economists are struggling with the difficult problem of the high cost of medical care, we can help to solve it materially, by helping our patients to cut down the loss of time due to sickness; by shortening hospital stays and promoting the convalescent home for the convalescent; by public health education which will assist our patients to avoid illness and to resist the lure of patent medicines which still, according to the best statistics available, consume more than twice as much of their income as doctors' fees."

Dr. O. E. Locken, Crookston: "We must be frank in our public health work. We shall not be obliged to force our conservative public health program down the throats of the laity if we inform them adequately first."

Dr. E. A. Meyerding, St. Paul: "A system for a government disability insurance policy by which the war veteran could choose his own doctor and his own hospital in case of illness would relieve the government of the vast burden of hospital building its present scheme for veterans' care involves. It would utilize the empty beds which are already the serious problem of every civilian hospital and thus lower the cost of hospital care to everybody and at the same time, preserve his self respect and right of choice to the soldier."

Dr. E. M. Hammes, St. Paul: "The committee on Medico-Legal Affairs strongly urges the creation of a psychiatric service which may be at the disposal of the courts for every juvenile case, no matter what its nature and to function before condition of every felon. It is necessary protection to the offender and to society as well. On the one hand, many of them are in need of medical care instead of punishment. On the other, lacking such a service, many mental cases are released at the expiration of their prison terms entirely free and as great a menace to society as before they were sentenced."

Dr. A. C. Schulze: "There are three classes of schools for laboratory technicians in Minnesota. The University courses offered at the hospitals are all of them adequate, thorough and reliable. The commercial schools, in several cases, offer only a six months course, with inadequate teaching facilities and instructors. One of these charges $215 for a six months course, the other $250. They carry on a remarkable program of advertising and promise excellent positions. On the strength of the promises and the short course these commercial schools have proven very attractive. There is practically no limit to what they can do and remain within the laws of Minnesota. Physicians should inform themselves thoroughly about these schools.

"Certainly no institution teaching medical technology can expect to have the endorsement of organized medicine that does not have at its head a director who has the title of M.D. or whose teachers are not registered technicians; that has not sufficient physical equipment to properly carry on this work and is not actually connected with a hospital for the purpose of securing clinical material; whose course is not at least 12 months long or that is openly commercial or carries on pernicious advertising."

OF GENERAL INTEREST

Dr. H. L. Huffington, Mankato, has returned from a vacation trip to northern Wisconsin.

Dr. Roland E. Nutting, formerly with the Mayo Clinic, is now located in Duluth, Minnesota.

Dr. Anderson C. Hilding, formerly of Duluth, Minnesota, is now associated with the Mayo Clinic.

Dr. John F. Madden has announced the opening of offices at 842 Lowry Medical Arts Building, Saint Paul.

Dr. Joseph N. Gehlen, formerly associated with Dr. Hensel, recently opened an office at 642 Lowry Medical Arts Building.

Dr. M. I. Howard of the Mankato Clinic, Mankato, has resumed practice following a vacation spent in southern Minnesota.

Dr. C. A. McKinlay was called to Wichita, Kansas, July 17, because of the death of his father, Mr. L. McKinlay, of that city.

Dr. John J. O'Hara of Janesville has returned to his practice following an illness which confined him to the hospital for several weeks.

Dr. W. P. Crane left the Ancker Hospital July 1, after completing his internship, and will practice with his father, Dr. G. H. Crane, at Holstein, Iowa.

Dr. H. T. Petraborg of the University of Minnesota, class of 1929, has become associated with Dr. W. R. Humphrey in practice at Stillwater, Minnesota.

Edward Bratrud, F.A.C.S., of Warren, Minnesota, was elected to membership in the American Urological Society at a recent meeting held in New York City.

Dr. Edward C. Gibbs has become associated with Dr. Charles N. Hensel in the practice of internal medicine with offices at 1014 Lowry Medical Arts Building, Saint Paul.

Dr. P. D. Ward took up his duties as superintendent of the Miller Hospital, Saint Paul, July 1. Dr. Ward was formerly assistant director of the Albert Merritt Billings Hospital, Chicago.

Dr. Richard M. Johnson, formerly a graduate fellow in the Department of Medicine, University of Minnesota, is now affiliated with Dr. A. E. Olson and Dr. C. E. Alexander of Duluth, Minnesota.

Dr. George B. Weiser, New Ulm, was recently elected the new president of the Minnesota State Board of Medical Examiners. Dr. E. J. Engberg, Saint Paul, was elected secretary to take the place of the former secretary, Dr. E. T. Sanderson, Minneota.

Information has just been received that Dr. Thomas P. Noble, formerly in orthopedic surgery in the Mayo Foundation, has recently returned to Great Britain after three years of service in the Medical School of Chulalongkorn University at Bangkok, Siam, and has just been appointed by the King of Siam for three years as head of the surgical service of the Siamese government.

Dr. Richard Everingham Scammon, Professor of Anatomy at the University Medical School, has been appointed Professor of Anatomy at the University of Chicago. Dr. Scammon came here from the University of Kansas in 1911 as associate professor, and became full professor of anatomy in 1914. He has interested himself particularly in the anatomy of the growth of children and has published two books on the subject.

Quoting from the A. M. A. Journal of July 5, 1930: "Some eighteen names of physicians in the United States have been proposed for Affiliate Fellowship and approved by the Council of Scientific Assembly." The following seven are from Minnesota:

Dr. Herbert Davis, St. Paul; Dr. G. Deziel, Minneapolis; Dr. Geo. McIntyre, Minneapolis; Dr. Jennette McLaren, St. Paul; Dr. H. S. Nelson, Minneapolis; Dr. W. C. Portman, Jackson; Dr. W. H. Robilliard, Faribault.

Dr. Clarence M. Jackson, Director of the Institute of Anatomy at the University of Minnesota, and Dr. Richard E. Scammon, Professor of Anatomy at the University, have been honored by the selection of a symposium to which they contributed as the August "book of the month" by the Scientific Book Club. The book is *The Measurement of Man,* a study in biometrics which will be published by the University of Minnesota Press early in August. The late Dr. J. Arthur Harris, who was head of the Minnesota Botany department, and Dr. Donald G. Paterson, professor of Psychology, are the other authors contributing to the volume, which is the first Minnesota book to be selected as a "book of the month" by any book club. The essays in this symposium were originally lectures delivered at the university under the auspices of Sigma Xi.

It was formally resolved by the House of Delegates at the annual meeting of the State Association in Duluth to recommend Dr. Robert Emmett Farr, Minneapolis, for the next Nobel prize in medicine. Dr. Farr's work in the development of local anesthesia and anesthesia of the phrenic nerve has been individual, brilliant, and far reaching. It wholly merits, in the opinion of the house as expressed in the resolution, the most distinguished world recognition. In the absence of Dr. Farr, who is ill in Minneapolis, an important paper in which he outlined the principles involved in administration of local anesthesia was read by Dr. W. N. Graves, Duluth, as a feature of the symposium on anesthesia Wednesday morning. Two extraordinary moving pictures made by Dr. Farr himself, more than sixteen years ago when teaching, and demonstration by means of films, were shown by Dr. Stanley Maxeiner, Minneapolis, following the paper.

CONSULTATION BUREAU

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11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I would like to have your opinion on the etiological probabilities of a type of dermatitis which we have been encountering in bakery workers. The skin lesions present classically the pictures of the moist eczematous lesions of the usual chronic type, practically without exception occurring on the forearms but in some cases more widely distributed. I have made an effort to eliminate certain factors and, so far, have been unable to reduce our field to any single agent.

   Answer.—The following information has been secured about baker's dermatitis. Three suggestions were offered:

   1. That it is due to the excessive use of soap and water, keeping the hands and arms clean.
   2. That it was related some way to the materials used in the bakery.
   3. That it was coincidence.

   In order to determine the cause, it will be necessary to try skin tests. Select some of the common flours used, and apply them under oiled silk to the arms. It will be necessary to leave it on for at least 48 hours before the negative can be determined. Another method is to scarify the skin and put some of the powder on it. This gives an immediate reaction and can be read in 15 to 20 minutes. It is also possible to buy from many of the supply houses the common antigens, (flour, wheat, etc.). Not long ago an article appeared, stating that many of the occasional dermatoses were due to soap and water. It would be advisable to also consider it from this angle.

2. *Question.*—I have a patient, male, 56, who is having some difficulty in starting the flow of urine, frequency and burning. There is no history of venereal diseases. Residual urine by catheter after emptying the bladder amounts to 2 ounces. Prostate enlarged, irregular and sensitive to touch. Every time I massage the gland even so gently that it doesn't cause any pain in the prostate, the patient complains of a sharp pain, like a "toothache" at the end of the penis. What is the explanation? There must be some nervous connection between these two regions.

   Answer.—The enlargement is probably due to benign hypertrophy or prostatitis. The pain which is brought about by massage is apparently due to the inflammation or stone in the gland. Low ureteral pain is reflected to the end of the penis. Pressure on the prostate undoubtedly produces this reflex. The reason for the pain is the union of nerves from these two centers. What does the cystogram show and is there any evidence of ureteral stone in the lower portion?

3. *Question.*—Female patient, age 76, fairly well nourished, has lost 20 pounds the past two months and is lemon yellow color. Has been treated for double mitral and aortic lesion with decompensation for six months. Some edema of legs and some tingling. B.P. 120/0—apparently not decompensated now. Hemoglobin is 30 per cent. She has had recurrent attacks of vomiting, with temperature during the day or two it lasted. I feel a tender mass in the liver-gastric area which I regard as malignancy, as the outer portion of the liver does not seem to be enlarged as we would expect with a passive congestion. No dyspnea. The patient looks like she has carcinoma of the stomach. Have not checked the stools yet, but no blood in the vomitus. Unable to get patient for X-ray. Red smears show marked hyperchromasia, anisocytosis and poikilocytosis.

   Answer.—The smears are characteristic of pernicious anemia. It is possible that your patient also has carcinoma of the stomach. The blood change in both diseases may be identical. Both types of anemia may respond to liver treatment. I would advise that you start large doses of liver extract at once. We have seen remarkable responses as far as anemia is concerned in carcinoma of the stomach. When her heart condition improves, it would be advisable to move her and examine the stomach with the *x*-ray. Carcinoma of the stomach may be a local disease for a long time and if she has the condition, operation is indicated.

4. *Question.*—What is the best treatment for a pigmented nevus on the lower eyelid?

   Answer.—A pigmented nevus of the lower eyelid may be treated with carbon dioxide snow, radium, or radium emanation (radon), actual cautery, or surgical excision. The chief objection to carbon dioxide snow is the inability to localize the treatment. The eyelid usually swells and is rather painful. Radium or radium emanation may be used by protecting the cornea with a lead shield, which fits behind the eyelid. It is usually coated with paraffin and the eyeball desensitized with novocain. The actual cautery or surgical excision may also be used. Radium, or radium emanation, seems to be the treatment of choice.

5. *Question.*—I have a patient with anemia. Has occasional sore tongue, not suggestive, however, nor is there convincing evidence of atrophy. Gastric symptoms are absent as well as neurological. Hemoglobin is 35 per cent. R.B.C.s count 1,480,000. No foci of infection can be found, although I insisted on an extraction of an old root. The dentist said it was not abscessed. Patient has a tooth in which pulp cavity has become devitalized. The blood shows anisocytosis, poikilocytosis, and polychromatophilia. There is an excess of the large cell forms.

   Answer.—The smear is compatible with pernicious anemia. Have you done a gastric expression and determined the acidity? Check your neurological again. If no physical cause can be determined for the anemia, I believe that liver treatment, three or four vials of the extract daily, should be used without making a positive diagnosis of pernicious anemia.

6. *Question.*—I have a case of ulcerative colitis of about 6 weeks' duration. The stools are not sanguineous any more but the diarrhea persists and there is a gradual emaciation. What is the latest treatment for this type of a case? What is the status of Bargen's serum and where could it be obtained?

(Continued on following page)

OBITUARY

Arthur A. Law

1872-1930

Dr. Arthur A. Law was born at Harvard, Illinois, in 1872. After attending Shattuck Military Academy at Faribault, Minnesota, he took his medical training at the University of Minnesota Medical School, where he graduated in 1894.

During the Spanish-American war Dr. Law served as Lieutenant in the Medical Corps with the Thirteenth Minnesota Regiment and saw active service in the Philippine insurrection.

Early in his medical career he became identified with the Surgical Department at the University Medical School, and as Associate Professor of Surgery devoted much of his time to the University until his resignation a year ago on account of ill health.

With the rank of Lieutenant Colonel and as commanding officer of Base Hospital No. 26, the University of Minnesota Medical Unit, Dr. Law again gave valuable service to his country and at the close of the war was cited by General Pershing for exceptional meritorious and conspicuous service.

In 1922 Dr. Law became especially interested in thoracoplasty, in the surgical treatment of pulmonary tuberculosis and operated extensively at Glen Lake Sanatorium.

He was a member of the American, Western, International and Southern Surgical Societies, founder of the American College of Surgeons, a member of the Minnesota Academy of Medicine, besides being a member of Hennepin County, Minnesota State Medical Association and the American Medical Association. He was also a member of the Minneapolis, Minikahda and La Fayette Clubs, and of St. Mark's Church.

Dr. Law married Helen Elizabeth Lougee, by whom he is survived. His two daughters, Mrs. James G. Fullerton, Jr., and Mrs. John McD. Webb, of Minneapolis, and his mother, Mrs. Eva Ayer Law of Tacoma, also survive him.

Dr. Law's ingratiating manner and real love of humanity gained him a wide circle of friends and his name will long be identified with the leaders in surgical activities, not only in this state but throughout the country.

(Continued from page 588)

Answer.—It would be advisable to find the cause of your patient's diarrhea. Send a stool specimen to the Laboratories of the State Board of Health, on the campus. They furnish special containers for this purpose. The chances are that the patient is suffering with so-called nonspecific ulcerative colitis. Ileostomy is recommended before the patient emaciates too much. A bland diet, bed rest, transfusions for anemia, and subcutaneous fluid are used. There is a tendency toward remission. A few cases have lived for many years. Dr. J. A. Bargen, Mayo Clinic, would be very glad to inform you about the present status of his serum, and as to where it may be obtained.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

The speaker is William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of August will be as follows:

August 6—Poison Ivy.
August 13—Knock Knees and Bow Legs.
August 20—Cause of Fever.
August 27—Cancer of the Stomach.

The annual meeting of the Southern Minnesota Medical Association will be held August 25, at Mankato, Minnesota. It will be a one-day session and an innovation is being tried this year in that the morning session is given over to clinical demonstrations and clinics.

On account of the type of demonstration on spinal anesthesia, it is necessary to have this demonstration at St. Joseph's Hospital at 8 o'clock.

The Teachers' College building with five class rooms equipped with blackboards, lantern slide projectors, and machines has been made available. This lends itself exceedingly well to clinical demonstrations and clinics.

Lunch will be served at the Teachers' College building, and the banquet will be held at the Mankato Country Club.

A feature of the morning session is the presentation of interesting case reports by various men throughout southern Minnesota. An hour and a half will be given over to that. It is hoped that as many men as possible will bring reports of interesting cases they have seen for discussion.

PROGRAM

MORNING SESSION

8:00 o'clock—St. Joseph's Hospital

Clinical demonstration of spinal anesthesia.
W. C. STILLWELL, M.D., Mankato.
Discussion: C. F. McCUSKEY, M.D., Rochester.

9:00 o'clock—Teachers' College Building

Clinical sections and demonstrations will be held in the class rooms.

9:00 A. M. Clinical demonstration of varicose vein injection and treatment.
C. F. DIXON, M.D., Rochester

9.00 A. M. Clinical-pathologic demonstration.
W. A. O'BRIEN, M.D., Minneapolis.

9:00 A. M. Hematology demonstration.
F. J. HECK, M.D., Rochester.

10:30 A. M. Pediatric clinic.
R. N. ANDREWS, M.D., Mankato.

10:30 A. M. *X*-ray demonstration.
L. G. Rigler, M.D., Minneapolis,
J. D. Camp, M.D., Rochester.

10:30 A. M. Uroselectan: Indications and uses.
E. P. Cathcart, M.D., Rochester.

11:30 A. M. Unusual case reports. Discussion led by:
W. A. O'Brien, M.D., Minneapolis.

1. Hemachromatosis.
J. J. Heimark, M.D., Fairmont.
2. Fat embolism.
A. L. Vadheim, M.D., Taylor.
3. Congenital pyloric stenosis.
B. J. Gallagher, M.D., Waseca.
4. Malignant tumor: Meckel's diverticulum.
L. S. Faust, M.D., Rochester.
5. Vicarious menstruation.
W. C. Bernstein, M.D., New Richland.

(Others to be announced later.)

12:30 o'clock. Luncheon and business meeting at Teachers' College Building.

AFTERNOON SESSION

1:30 o'clock—Auditorium of Teachers' College Building

The Art of Medicine.
W. C. Alvarez, M.D., Rochester.

Coronary disease with special reference to acute coronary accidents, their recognition and treatment.
H. W. Rathe, M.D., Waverly, Iowa.

Acute surgical conditions of the abdomen, their diagnosis and treatment.
Author to be announced later.

Hypertension: Case report of unusual vascular disease.
Charles Koenigsberger, M.D., Mankato.

Backache from the orthopedic viewpoint.
R. K. Ghormley, M.D., Rochester.

The prostate gland in a general examination.
A. E. J. Sohmer, M.D., Mankato.

Treatment of Bright's disease.
Moses Barron, M.D., Minneapolis.

Non-myxedematous hypothyroidism.
C. H. Hensel, M.D., St. Paul.

Epileptic seizures, their relationship to brain tumor.
H. L. Parker, M.D., Rochester.

The importance of toxic goiter complicating or complicated by other conditions requiring surgical interference.
C. W. Mayo, M.D., Rochester.

Appendicitis. A study of 100 consecutive cases.
Sigrud Gunderson, M.D., LaCrosse, Wis.

BANQUET

6:30 o'clock—Mankato Country Club

Toastmaster—Waltman Walters, M.D., President.

Addresses by:

W. J. Mayo, M.D.

S. H. Boyer, M.D., President of the Minnesota State Medical Association.

E. S. Judd, M.D., President-elect of the American Medical Association.

W. A. Rohlf, M.D., President of the Iowa State Medical Association.

ANNUAL MEETING AT DULUTH

The annual meeting of the State Association held at Duluth was particularly well attended, there being 641 registrants as compared with 500 at the meeting three years ago at Duluth. The participation by guests from other parts of the country and from abroad afforded added interest to the program.

The scientific program was diversified but in the main interesting. The poor acoustics of the ballroom of the Hotel Duluth detracted considerably from the enjoyment of the program. Few physicians know how to speak well, and on the other hand, few are at ease with the microphone of a loud speaker. They can learn, however. It was also unfortunate that the county delegates had to miss so much of the scientific program, through attendance at the two meetings of the House of Delegates. This conflict should and doubtless will be avoided in the future. A dozen or more members had the unfortunate experience of having their pocketbooks stolen from their rooms in the Hotel Duluth while they peacefully slept. Travelers' checks are not much bother and will doubtless be more popular with certain members attending state meeings in the future.

Advantage was taken of the opportunity to obtain an expression of opinion regarding the value of Dr. Hanson's thymic extract in the treatment of cancer. Some twenty-five Minnesota physicians met and each gave his experience. No cures were reported. For the most part advanced cases of carcinoma in which surgery, *x*-ray or radium had failed constituted the majority of those reported. In a few instances the physicians thought there was a definite reduction in the size of metastatic tumor growths. Some reported the definite relief of pain. Dr. Hanson referred to experiments now being conducted to test the true value of his extract.

Our meetings in Duluth are always popular. Not too far to reach by motor, the scenic grandeur of Minnesota's port never fails repeatedly to thrill the visitor. And there is always evident a feeling of real cordiality on the part of the Duluth members of the Association.

The minutes of the meeting will eventually appear in the journal. Suffice it to say that our next meeting will be in Minneapolis and the following officers were duly elected:

President—Dr. L. Sogge, Windom.

First Vice President—Dr. W. H. Condit, Minneapolis.

Second Vice President—Dr. O. W. Parker, Ely.

Secretary—Dr. E. A. Meyerding, Saint Paul.

Treasurer—Dr. A. G. Schulze, Saint Paul.

Councilor Second District—Dr. W. A. Piper, Mountain Lake.

Councilor Fourth District—Dr. J. S. Holbrook, Mankato.

Councilor Sixth District—Dr. N. O. Pearce, Minneapolis.

Councilor Eighth District—Dr. O. J. Hagen, Moorhead.

A. M. A. Delegates—Dr. H. M. Johnson, Dawson; alternate, Dr. B. S. Adams Hibbing. Dr. W. F.

Braasch, Rochester; alternate, Dr. W. L. Burnap, Fergus Falls.

WABASHA COUNTY MEDICAL SOCIETY

The sixty-second annual meeting of the Wabasha County Medical Society was held at Wabasha Thursday, July 10, Doctor Russell H. Frost presiding.

There were twenty-four in attendance, including members, guests and accompanying doctors' wives.

At the business session in the forenoon, various matters were discussed, committee reports received, and one new member was elected, Dr. Clifford N. Rudie of Mazeppa. Officers were elected for the coming year as follows: President, Dr. E. C. Bayley, Lake City; vice president, Dr. W. B. Stryker, Plainview; secretary-treasurer, Dr. W. F. Wilson, Lake City. Delegate to state association, Dr. W. H. Replogle, Wabasha; alternate, Dr. D. P. Dempsey, Kellogg. Censor for three years, Dr. J. A. Slocumb, Plainview, to serve with Drs. Cochrane of Lake City and Bond of Wabasha. It was voted to hold the next annual meeting at Lake City.

Dinner and other entertainment was afforded through the courtesy of the members residing at Wabasha and Kellogg.

In the afternoon, the following program was presented:

President's Address—"Some Newer Aspects of the Tuberculosis Problem," Dr. Russell H. Frost, Superintendent Buena Vista Sanatorium, Wabasha.

"Undulant Fever with Report of a Case," Dr. E. Cóvell Bayley, Lake City.

"Recent Developments of Surgery," Dr. Waltman Walters, Mayo Clinic, Rochester.

"Surgical Problems of the Gall-Tract," Dr. Joseph S. Collins, Wabasha.

"Relation of the Medical Profession to the Public," Mr. F. Manley Brist, Attorney for the State Board of Medical Examiners, Saint Paul.

Other speakers were Dr. M. S. Henderson of Rochester, Councilor for this district, and Prof. Felix von Mikulicz of the Frauenklinik, University of Berlin, who came as a guest with the surgeons from the Mayo Clinic. It was esteemed quite a privilege to hear this distinguished German professor talk on the methods of treating cancer at his clinic.

All the papers were well received and elicited general discussion.

A rising vote of thanks was tendered to the outside speakers and all those who had part in the entertainment of the society.

W. F. Wilson, M.D., *Secretary.*

SCOTT-CARVER COUNTY MEDICAL SOCIETY

A meeting of the Scott-Carver County Medical Society was held at Watertown, Minnesota, July 8, 1930.

Dr. C. D. Harrington of Minneapolis addressed the society on the "X-ray Diagnosis of Gastrointestinal and Gallbladder Lesions."

Dr. A. E. Benjamin discussed the "Lesions of the Gastrointestinal Tract and Gallbladder and Their Surgical Treatment." Upon invitation from Dr. F. H. Buck it was decided to hold the next meeting at Dr. Buck's cottage at Prior Lake in August.

B. H. Simons, Secretary.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

UNLICENSED PRACTITIONER OF MEDICINE FINED $500

State *vs.* Ziegler

The defendant, Fred Ziegler, of Elmore, Minnesota, was arrested June 18, 1930, for practicing medicine without a license at Springfield, Minnesota. The defendant, a man sixty-one years of age, has been engaged in bleeding and cupping for the past twenty-six years in Faribault County. He has no medical education except a correspondence course in Chiropractic. He claims to have a "Degree of Doctor of Naturopathy." On Friday, July 11, Ziegler entered a plea of guilty before the Hon. A. B. Gislason, Judge of the District Court at New Ulm, Minnesota, and was fined $500. Ziegler paid the fine. The defendant was warned that he would have to refrain from practicing in the future or he would be dealt with more severely. The imposing of substantial fines as was imposed by Judge Gislason in this case will go a long way in eradicating quacks, fakers and unlicensed practitioners. The Court in no uncertain terms informed the defendant that such practices would not be tolerated in this State. Judge Gislason is to be commended not only by the medical profession, but by the public, for his firm stand on these matters. The matter was handled by Mr. Brist on behalf of the State Board of Medical Examiners and splendid coöperation was received from T. O. Streissuth, County Attorney, and Sheriff J. J. Reitter of Brown County.

DIGESTIVE ENZYMES FOR ORAL ADMINISTRATION OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that in consideration of the replies to a questionnaire sent out in 1925 it was decided at that time to continue the acceptance of gastric ferment preparations, including those intended for internal administration, to await confirmatory evidence in favor of their use. No acceptable evidence showing the value of gastric enzymes when administered orally having become available, the Council has omitted all digestive enzyme preparations save those recommended for use outside the body for the digestion of food previous to administration and locally for the softening of dead tissues or the solution of false membranes. The following are the products which have been omitted: Elixir of Enzymes (Armour & Co.); Essence of Pepsine-Fairchild, Gastron, Holadin and Diazyme Glycerole (Fairchild Bros. & Foster); and Panase (Frederick Stearns & Co.) (Jour. A. M. A., June 14, 1930, p. 1919.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK
205 W. 2nd STREET, DULUTH

THOMAS A. PEPPARD
MEDICAL ARTS BLDG., MINNEAPOLIS

OBSERVATIONS ON THE ETIOLOGICAL CORRESPONDENCE BETWEEN ANGINAL PAIN AND CARDIAC INFARCTION: Carey F. Coombs, From the University Centre of Cardiac Research, Bristol (Quarterly Jour. of Med., April, 1930, p. 233). The histories given by a series of patients presenting themselves because of precordial pain were scrutinized. These were divided into two groups, the first group of 86 cases consisting of cases in which cardiac pain, persistent in character, not necessarily excited by effort, was followed by evidence of gross injury to the wall of the heart; the second group, consisting of 201 cases, in which pain was excited by effort, relieved by its cessation, and not followed by structural sequelæ. The age and sex incidence of the two groups corresponded closely with one another.

The angina of effort occurs principally in association with cardiac syphilis, high arterial tension, and senile degeneration of the heart. Cardiac infarction occurred in the second and third of these groups; namely, hypertension and senile degeneration, but occurred rarely in cardiac syphilis. Both syndromes, *i.e.,* the angina of effort and cardiac infarction, are rare in the other infective and toxic diseases of the heart. The occurrence of cardiac pain in pernicious anemia is referred to. In the author's own series of 36 cases, substernal pain of the cardiac type was mentioned eight times, a much higher incidence than Willius and Giffin encountered in their cases.

There are three structures concerned in the supply of arterial blood to the wall of the heart: the first part of the aorta, the aortic semilunar valves, and the coronary arteries. For proper function the aorta must be elastic, the semilunar valves competent, and the coronary arteries pervious and distensible. Competency of the aortic valves is the least essential requisite of this apparatus for supplying blood to the cardiac wall. The author inclines to believe there is no real rivalry between the aortic and coronary hypothesis of angina. In some cases, it is the fault of one, in others the fault of the other part, and again both parts may be so damaged as to be inefficient. The author believes coronary arteries to be the principal offenders in provoking angina. Rigidity of the coronary arteries as well as stenosis has an important bearing on the efficiency of the artery. Cardiac infarction is rare in cardiac syphilis, because it does not alter the arterial linings in such a way as to prepare them for the formation of thrombi, these vessels being attacked by this condition only at their orifices.

It is concluded that pain of an anginal kind is produced by all the diseases which fail to forward oxygenated blood to the cardiac muscle.

T. A. Peppard, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART
951 MEDICAL ARTS BLDG., MINNEAPOLIS

ROY N. ANDREWS
MANKATO CLINIC, MANKATO

PHENYLETHYLHYDANTOIN IN THE TREATMENT OF SYDENHAM'S CHOREA: Hartzell H. Ray, M.D., and John S. Cunningham, M.D., Rochester, N. Y. (Amer. Jour. of Dis. of Children, Vol. 39, No. 6, June, 1930). Phenylethylhydantoin was introduced under the name "nirvanol" in 1916 as a sedative. The frequent occurrence of severe symptoms such as rash or fever led many authors to warn against its use. In 1919, Roeder recommended phenylethylhydantoin in the treatment for chorea minor.

The dose for younger children was 0.3 Gm. (5 grains) per day; for the older children, 0.6 Gm. (10 grains); the drug was given for from seven to nine days.

Observations suggest the following conclusions: Treatment with phenylethylhydantoin greatly shortens the course of Sydenham's chorea. This effect is more obvious in the more severe cases. The recurrence of chorea is no more frequent after the administration of phenylethylhydantoin than after other forms of treatment. The beneficial results did not always seem to depend on the development of fever or rash. On the basis of this small series of cases, no claim can be made that all patients with chorea will respond to the treatment. The relatively poor response in mild cases strongly suggests that many will not.

Phenylethylhydantoin proved more effective than other drugs in the treatment of chorea. In the present comparative study, the mean duration of chorea from the beginning of treatment was thirty-one days when phenylethylhydantoin was used, and one hundred and fifteen days when other drugs were used.

Mild chorea is not so rapidly cured as is the severe

form. Although "nirvanol sickness" may cause considerable temporary discomfort, we have observed no permanent harmful effects from the drug.

On account of the possible danger of injury to the bone-marrow, it is desirable that frequent blood counts be made in cases in which patients with chorea are treated by phenylethylhydantoin. The administration of the drug should not be continued over periods longer than ten days, or after the appearance of the eruption.

R. N. Andrews, M.D.

ASTHMA IN CHILDREN: M. Murray Peshkin, M.D., New York (Amer. Jour. of Dis. of Child., April, 1930, Vol. XXXIX, No. 4). With the introduction of protein skin tests in the past decade, the entire subject of asthma from the standpoint of etiology and treatment has undergone radical revision.

It has become evident that to fix the causative factor in asthma there is required not only a complete series of protein skin tests accurately performed and properly interpreted, but a carefully taken history, a physical examination, including roentgenoscopy of the chest, tuberculin skin and various laboratory tests, and a careful study of the patient over a considerable period.

A practical method of classification of asthma along etiologic lines is now possible. In this new classification there are three main groups, which include all types of asthma: (1) protein sensitive asthma; (2) protein non-sensitive asthma, and (3) para-asthma (these cases are directly caused by an enlarged thymus or enlarged bronchial lymph nodes or both, and also by any pathologic condition inducing tracheobronchial stenosis).

It must be conceded that at least between 10 and 60 per cent of the patients who have received modern treatment continue to have asthma.

Twenty-five children (twenty-two children sensitive and three non-sensitive to protein) were treated by a change of environment. In spite of the fact that the inhalant and the dietetic restrictions were kept less rigid than at home, twenty-three children, or 92 per cent, were markedly improved or entirely relieved of asthma. Seventeen of these twenty-five children have been returned to their homes for periods varying from 6 months to 5 years or an average of 2 years per patient. Thirteen of these seventeen children, or 76 per cent, are not greatly improved or relieved from asthma. In some of these children, appropriate treatment after change of environment was successful, whereas it has failed before.

Until newer methods of treatment are advanced which will successfully control or free this group of children from asthma, the establishment of a "home" where a child with chronic refractory asthma can be kept for at least six months, is regarded as a humane, urgent and economic necessity, as well as a therapeutic measure of definite value.

R. N. Andrews, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

VIRGIL J. SCHWARTZ

617 MEDICAL ARTS BLDG., MINNEAPOLIS

ARTHUR C. DEAN

HOT SPRINGS, SOUTH DAKOTA

ATROPHIC AND VASOMOTOR RHINITIS Simon L. Ruskin, New York (Arch. of Otolaryng., Vol. II, No. 6, June, 1930, p. 689). In a series of cases in which I gave injections into the sphenopalatine ganglion for relief from the painful syndrome of neuralgia of the nasal ganglion, following the injection I observed nasal congestion that lasted for a period of time varying from a few days to two or three months.

It also occurred to me that in the more advanced state of so-called atrophic rhinitis there may be a profound and continued influence on the vasoconstrictor nerves, inducing a state similar to that of Raynaud's disease in the extremities. I selected a typical case of atrophic rhinitis. I made injections into both nasal ganglions by the posterior palatine route. Following the injection there was a gradual diminution of nasal secretion with a lessening in the amount of crusting. Subsequently, the tissues began to take on a pinkish color and to assume a fuller appearance. After three weeks, it was apparent that the left side was improving more rapidly than the right. I therefore again gave injections into the right nasal ganglion. Within a few days after the injection the right side showed distinct improvement. At present, there is hardly any crusting on the left and only a small amount of crusting on the right. The foul odor has practically disappeared. The patient formerly suffered from an associated dry pharyngitis. At present she is practically free from any complaint referable to the pharynx.

I am led to suggest that atrophic rhinitis, so-called ozena, when not due to sinusitis is a disease caused by the abnormal sensitiveness of the vasoconstrictor nerves resulting in a continuous or intermittent spasm of the smaller arteries and arterioles.

Just as interesting as the influence of freeing the atrophic nasal membrane from the vasoconstrictor action is that induced by section of the vasodilators in so-called vasomotor rhinitis. In the tonic or intermittent overaction of the vasodilators there is a boggy, bluish, pale membrane filling the nasal fossæ and seeped in thin serous discharge. This appearance is common in allergic conditions and is variously diagnosed. When it is associated with specific sensitivity as demonstrated by skin tests, it is classed as hayfever or protein sensitivity. When it is not associated with a specific skin reaction, it is frequently called vasomotor rhinitis. The observations on both nasal mem-

branes are the same, and the interesting thing is that both react alike to blocking of the vasodilators. In both instances the nose becomes dry and the nasal passages clear.

In the allergic states both nasal ganglions must be blocked simultaneously. Following the injection of alcohol-phenol, the cheeks become somewhat puffy for a few days as after the extraction of a tooth. The dryness of the nose becomes apparent in about twelve hours, at times within one or two hours.

CONCLUSIONS

Atrophic rhinitis when not due to sinusitis is a disease caused by the abnormal sensitiveness of the vasoconstrictor nerves which results in a continuous or intermittent spasm of the smaller arteries and arterioles.

Vasomotor rhinitis is a disease similarly caused by the abnormal sensitiveness of the vasodilator nerves which results in a continuous or intermittent relaxation of the smaller arteries and arterioles.

Both the vasodilators and the vasoconstrictors of the nasal mucous membrane can be cut or blocked at the nasal ganglion.

ARTHUR C. DEAN, M.D., F.A.C.S.

SUB-MAXILLARY FOSSA APPROACH TO DEEP PUS IN THE NECK: Harris P. Mosher (Trans. of the Amer. Acad. of Ophthalmology and Otolaryngology, 1929. Page 19). The pharyngo-maxillary fossa most frequently becomes infected by extension from the following structures: first, the tonsils; second, the glands just anterior to the second cervical vertebra and its fascia, which drain the nose and pharynx and are the glands that suppurate in the retropharyngeal abscess of infants; third, the parotid or the tip of the mastoid. Pus thus formed may kill the patient by rupturing into the larynx or trachea, or more slowly by causing a thrombosis of the internal jugular vein with subsequent septicemia.

The cervical fasciæ are prolongations of the carotid sheath. This makes the carotid sheath a core of all the soft structures of the neck. By following it pus may reach the base of the skull above or the chest below, so it must be followed in ordered to locate hidden abscesses as this is the natural highway for pus.

There are three fossæ in this region—two actual, the sub-maxillary and the parotid, and one potential, the pharyngo-maxillary. The last may be regarded as a cone, with the base attached to the skull around the jugular foramen and the apex at the hyoid bone. The carotid sheath emerges from the apex of the cone and for all practical purposes, continues the fossa into the thorax.

The inner boundary of the fossa is the superior constrictor muscle with the tonsil attached. The outer boundary below, is the internal pterygoid muscle lining the inner surface of the ascending ramus of the lower jaw; above it is the parotid gland, which at this point is not covered. Posteriorly are the prevertebral muscles and fascia. The fossa is divided into unequal parts by the styloid process and the muscles arising from it. These are in front of the great vessels and protect them.

In tying the external carotid artery, a large T-shaped incision is made beginning just below the angle of the jaw and following the edge of the sterno-cleido-mastoid down for about 2 inches. If the neck is thick and deep a rectangular flap is turned down. The object is then to find the tip of the great horn of the hyoid. The external carotid will then be found lying just outside the tip.

The sub-maxillary fossa approach commands the side and base of the tongue, the floor of the mouth, and the neck from the base of the skull to the clavicle. A generous T-shaped incision is made and the sub-maxillary gland is exposed and turned up. The facial vein runs across the middle of the field so it must be tied and cut. The carotid sheath lies opposite the tip of the great horn of the hyoid. The sheath is then followed upward and downward. Upward the finger enters the pharyngo-maxillary fossa and passes to the outside of the tonsil. Continuing upward the styloid process is felt and lateral to this, the base of the skull.

In dealing with pus at the base of the tongue or in the floor of the mouth, an incision is made at the base of the sub-maxillary fossa. This can be carried forward or backward as indicated.

L. G. FLANAGAN.

BRONCHIECTASIS, AN UNAPPRECIATED CAUSE OF CHRONIC BRONCHITIS: Alton Ochsner (Jour. A. M. A., Vol. 93, p. 188, July 20, 1929). This is an article about bronchiectasis and gives a new way to introduce iodized oil into the lungs. The author calls it the "passive technic."

1. Use antiseptic mouth wash.
2. Paint anterior surface anterior tonsil pillars with 10 per cent cocain solution until swallowing reflex is lost.
3. Three c.c. 3 per cent procain hydrochloride solution is taken into mouth. Tip head backward, protrude the tongue, lean slightly to side that it is desired to fill, breathe.
4. Paint the anterior pillars again as in procedure 2.
5. Place patient behind fluoroscopic screen—swallow 10 c.c. iodized oil—assume position and tactics as in procedure 3. Watch oil flow into lung.
6. Expectorate saliva and inhale a second 10 c.c. of the oil.

A. C. DEAN, M.D., F.A.C.S.

ROENTGENOLOGY

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STUDY OF ROENTGEN THERAPY IN MENTAL AND NERVOUS DISEASES OF CHILDHOOD: W. von Wieser (Strahlentherapie, Bd. 31, 1928, 147-163). This study of the effect of roentgen therapy in mental and nervous diseases of childhood was begun in 1923 as a result of the observation that the irritability of children can be improved by radiation of the brain. It was then observed that other symptoms besides irritability were influenced by radiation. The symptoms which can be influenced are classified at length under

(A) Mental disturbances, which include disturbances of the senses, memory, coördination, attentiveness, vanity, feelings, moods, affections, disturbances of the primitive motions and actions, temperament, character, and

(B) Bodily disturbances, including the various abnormalities of development, deficiencies of speech, stuttering, gross motor defects, as muscular weakness and lameness, convulsive attacks, endocrine disturbances, etc.

While at first the attempt was only to treat the symptoms, cases were later treated systematically according to the diagnosis, as the favorable effect on many symptoms was gradually made manifest.

The indications based on Ziehen's classification include:

(A) Psychoses with defects of intelligence under which are included:
  I. Congenital psychoses, as mongolism (see below, abstract of special article dealing with this condition), dysgenital imbecility and microcephalic imbecility.
  II. Acquired psychoses (dementia), including various forms of dementia epileptica, and dementia on the basis of encephalitis, meningitis, etc.

(B) Psychoses without defects of intelligence, including various forms of noetic psychoses, periodic psychoses and psychotic constitutions.

(C) Bodily disturbances with normal mentality, under which are included disturbances of growth, as chondrodystrophy and dwarfism.

It is pointed out that mental improvements are usually secondary to bodily improvements and that this is one explanation of the mental effects obtained as a result of radiation, which first brings about an improvement in growth and in the physical condition. The effects on other symptoms are due to the well known beneficial effects of radiation on inflammations and scars, which are the underlying pathology in some of these conditions.

Radiation was directed primarily to both temporal regions. Because of the associated endocrine disturbances in most of these cases, the thyroid, thymus and genitals were soon also treated and later also the cervical, thoracic and lumbar spinal cord, adrenals and tonsils, because symptoms due to abnormalities of these parts were often present.

Tuberculosis is often a complication. Radiation is then usually not indicated until the tuberculosis has improved, when it may be unnecessary because of the coincident improvement in the neurological and mental condition. Treatment is not indicated in high grade hydrocephalus when active inflammation is present, in cases of marked microcephaly when the sutures are completely closed, and in all cases with marked elongation of the dorsum sellæ.

Experience has led to a marked reduction in the doses at first given and in certain cases to an increase in the intervals. The head is now radiated through five different areas, one area at a time. According to the nature of the cases, treatment of combinations of regions is indicated, as brain, spinal cord, and the glands of internal secretion.

The most difficult and important problem is the determination of the correct dose. Complete clinical examination, taking into account all associated conditions, is a necessary preliminary. Basal metabolism, capillary microscopy and especially the ferment reaction of Abderhalden, are of great value in dosage estimation. The most important thing to realize is that doses of 1 to 2%, measured at the lesion, given once a week, which for other purposes are considered small doses, may under certain conditions be 5 or 10 times as large as should be given.

EDWARD SCHONS, M.D.

FURTHER EXPERIENCES WITH ROENTGEN THERAPY IN PSYCHIATRIC AND NEUROLOGICAL DISEASES. I. Mongolism: W. von Wieser (Strahlentherapie, Bd. 32, 1929, 215-292). The writer has made a considerable study of the effects of roentgen treatment in various forms of weak-mindedness in children. This paper is his first publication on a specific disease, having chosen mongolism as his first subject for 6 reasons: (1) It is the easiest to treat; (2) with the exception of myxedema and cretinism, it is the best known; (3) it is the most exactly defined; (4) its course without treatment is at least known to some extent; (5) likewise its course under medical treatment; (6) the cases are so similar that comparison between treated and untreated cases is possible.

The first part of the paper deals with a description of the disease and its principal symptoms, pathological and anatomic findings, prognosis and results with usual treatment. The paper is based on his experiences in the examination and treatment of forty-six cases, varying from 6 months to 18½ years of age. Twenty-eight of the cases received deep *x*-ray therapy. Of the untreated cases it was possible to follow 6 cases

as controls. The time of observation of the treated cases ranged from 8 months to 3⅔ years, the average period of observation of the treated cases being 17 months, of the untreated 26 months.

The first physical characteristic proven to be influenced by roentgen treatment is the growth in height and weight. The effect of *x*-ray treatment on the rate of growth is discussed very elaborately and compared with the untreated control cases by numerous charts and curves. The studies show that the effect of *x*-ray treatment on the rate of growth in mongolism is almost as marked as the effect of thyroid treatment in cretinism and myxedema. Comparison of treatment of mongolism by organotherapy is not possible, as there are no cases reported in the literature. It is emphasized particularly that the maximum or most favorable effect on the growth is directly dependent on the correct dosage, either too small or too large a dose being detrimental.

The effects on the many features of these cases are discussed in detail and compared with the control cases, the treated cases showing a marked advantage in the improvement of all symptoms over those which were not treated. Less reliance is placed upon comparison of the psychic symptoms before and after treatment with those of the control cases than on the physical characteristics, comparison here being more difficult. A definite improvement in mentality, speech, and progress in school work is, however, shown. Practically all of the symptoms showed the greatest improvement at the ages from 4 to 7. This is attributed entirely to the dosage having been approximately correct for this age period.

The present treatment consists of irradiation of the head, using five areas, 6 × 8 cm., in size, at a 30 cm. target-skin distance, voltage 180 to 200 K. V. P., ½ mm. zinc plus 1 mm. aluminum, 5 to 10 per cent of the erythema dose per area, one to 2 areas a week at intervals of three to four days; in younger children often only one area in two weeks, in extreme cases only one area in four weeks. Usually the five areas were treated successively twice, followed by intervals of at first four and later six, eight or ten weeks. In the early cases the doses were greater, often two areas receiving each 25 to 30 per cent. Both areas were again treated in four weeks, with intervals of from six to eight weeks and over after the third series. The areas were so arranged that the lower half of the middle fossa of the skull and the nasal sinuses were treated. In children under three radiation of the entire body with 2 per cent of an erythema dose at 2 meters, given at intervals of four weeks, were frequently sufficient. Radiation of the thyroid, thymus and genitals with small doses was done at first but has now been given up, as the same results can be obtained more certainly with radiation of the skull. The dose is gauged according to the severity of the case and the age of the patient. Organotherapy was combined in the earlier cases but has been dropped, as its effects were found to be subordinate to those from radiation and such treatment was ineffective in taking the place of radiation.

Edward Schons, M.D.

CANCER DEATH RATES IN VARIOUS CITIES

A comparison of the cancer death rates in various cities throughout the United States indicates that the increasing incidence of the disease is not limited to any one section of the country. The accompanying chart shows the death rates from cancer in Boston, New York, Philadelphia, Chicago, St. Louis, and San Francisco, as computed by the United States Census Bureau. Each of these cities, it will be seen, had a higher rate in 1927 than in 1920. In New York, for instance, the cancer death rate per 100,000 of estimated population was 104.1 in 1920, and 139.0 in 1927, an increase of 35 points. In Boston, although the increase was not so great, the rate for 1927 was the highest among the six cities; that is, in 1920, the cancer death rate there was 116.9 per 100,000, and in 1927 it was 139.5. On the Pacific coast, San Francisco had a cancer death rate of 130.9 per 100,000 in 1920, and of 135.4 in 1927, while St. Louis, in the Middle West, had a rate of only 99.7 in 1920 and of 119.7 in 1927. In Chicago, the cancer death rate in 1920 was 103.6 and in 1927 it was 120.4. In Philadelphia, which has the lowest rates of the six cities, the increase was from 93.5 in 1920 to 112.0 in 1927. It must be remembered, however, in making a comparison of these different rates, that the recorded prevalence of cancer depends largely on the ability of the physician in diagnosing the disease and on the accuracy of death certificates. Increased efficiency and accuracy are probably responsible for some part at least of the rise in the recorded death rates. It must also be remembered that the death rates in the cities are higher than those in the rural districts because many patients are attracted from the country to the hospitals in the cities, and their deaths are often included in the city records. The importance of variations in correctness of diagnosis is shown by the fact that routine autopsies of patients in institutions for the aged or in large city hospitals reveal about 30 per cent of undiagnosed cases of cancer.

These statistics, based on adjusted rates, have been compiled from the reports of the United States Census Bureau, by the American Society for the Control of Cancer.—*Health News*, July 7, 1930.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

REPORT ON FIFTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, London, England, May, 1929. By Commander William Seaman Bainbridge, M.C.-F., United States Naval Reserve. 154 pages. Illus. Menasha, Wis., The Collegiate Press, 1930.

SURGICAL AND MEDICAL GYNECOLOGICAL TECHNIC. Thomas H. Cherry, M.D., F.A.C.S., Professor of Gynecology, New York Post-Graduate School and Hospital. Cloth. Price, $8.00. 678 pages, with 558 illustrations. Philadelphia: F. A. Davis Company, 1929.

The purpose of the author is best presented in his own words: "I have attempted to present in this work, which in all teaching is of great value, a single method of therapy, based upon anatomy and pathology and to give sufficient illustrations to make this logical and comprehensive; in the surgical descriptions to present a sufficient number of illustrated steps, that a gap in sequence would not exist, so that one could readily follow the operation to its completion."

The book is neither a text nor an encyclopedia. The method of treatment described for each condition is that one which the author has used with results satisfactory to himself. The reader is thus spared elaborate discussions of a variety of methods. The absence of physiology, symptomatology and of diagnosis emphasizes the single purpose of the volume.

The text is concise, but is supplemented so aptly by the author's own pen and ink engravings that the reader will be able to follow the steps of operative procedures with less difficulty than usual. These drawings are a feature of the book which the author refers to rather apologetically, but which the reader will find uniformly and singularly clarifying.

The book is divided into two sections, one on surgical, the other on medical technic. The first section occupies 520 pages.

In the surgical section the chapter headings will indicate the general arrangement of material, viz., Hernias, Plastics, Fistulas and Bladder Operations, Uterine Operations, Adnexal Operations, etc. There are also chapters on Suture and Drainage Material, on Anesthesia, with a considerable discussion of Spinal Anesthesia, and on the Care of Operative Gynecological Patients.

In the Medical Section there is a detailed description of the use of diathermy in pelvic infections of gonorrheal origin. In the gas inflation test for tubal patency he uses only a glass syringe, a uterine canula and a pressure gage—an astonishingly simple procedure compared, for example, to that followed by Rubin.

E. C. HARTLEY, M.D.

CLINICAL MEDICINE: Paul H. Ringer, 3rd Revised edition. $3.00. Philadelphia: F. A. Davis Co.

A comprehensive volume, practical, well presented, with material that is up to date.

The author states that the book is bereft of dogmatic material, and may be amplified to suit individual teachers' needs. I find this to be very true, and for this reason an excellent volume for outline material.

The author, in my opinion, has carefully considered the needs of the student nurse, and compiled his material accordingly. Particular attention has been given to pathology.

The volume does not give as much detail as the average clinical volume for teaching. The objection, however, to most clinical books for teaching has been too much detail.

INEZ PEYTON.

TUBERCULOSIS AMONG CHILDREN: J. Arthur Myers, Ph.D., M.D., F.A.C.P., with chapters by C. A. Stewart, M.D., Ph.D., and Paul W. Giessler, M.D., Minneapolis. 208 pages. Illus. Price, $3.50. 1930. Charles C. Thomas, Publisher, Springfield (Ill.) and Baltimore.

Tuberculosis in children and its relation to tuberculosis in adults has received intensive study during the past decade. The author has reviewed the vast literature fully and has combined it with his personal experience in private practice and as Medical Director of the Lymanhurst School for tuberculous children, in the preparation of this book. The result is a compact summary of our present day knowledge of tuberculosis in children as generally accepted by foremost teachers and clinicians.

The writer emphasizes the point that tuberculosis is a family disease which spreads largely by direct contact. Bovine infection is still a factor. The varying incidence of tuberculous infection in different parts of the country is pointed out, showing that tuberculous infection no longer may be considered universal. Tuberculous infection in infancy does not have the grave prognosis it once had. The importance of the tuberculin test at all ages is stressed, the Mantoux or intradermal being considered preferable to the von Pirquet. As to the general value of the skin test, the author states, "Tuberculin tests applied to all children of a community is the best method of approaching the tuberculosis problem. Among the positive reactors will be found children with the disease and among their adult associates will be found open cases of tuberculosis previously unrecognized."

The subject of "The Childhood Type of Pulmonary Tuberculosis" is treated fully, as it is found in infancy and later childhood. The necessity for routine x-ray films in all children reacting positively to tuberculin is emphasized. Family history is likewise important—

symptoms and physical signs may be entirely absent. The study of tuberculosis in children is of great value because such a large number of the 'teen age group developing the adult type of pulmonary tuberculosis shows x-ray evidence of a childhood type of pulmonary tuberculosis.

Well written chapters are contributed by Dr. C. A. Stewart on "Tuberculous Meningitis" and "Chronic Non-Tuberculous Basal Pulmonary Diseases in Childhood," and by Dr. Paul W. Giessler on "Tuberculosis of the Bones and Joints."

This brief volume should be of value to the medical student, general practitioner, pediatrician and to all those interested in tuberculosis in children. Each chapter contains a short summary and a very complete bibliography which is valuable for reference work.

P. M. MATTILL, M.D.

NEW AND NON-OFFICIAL REMEDIES, 1930. Cloth. Price, $1.50. Pp. 481; xlviii. Chicago: American Medical Association, 1930.

The present edition contains all of the features that have in the past made New and Non-official Remedies such a reliable and efficient guide to the physician who wishes to inform himself on the newer medicinal preparations: logical classification of preparations, with authoritative articles on each class; complete and carefully written descriptions of preparations; elaborate indexes; and a useful cumulative list of references to the literature on articles not accepted by the Council. Among the more important revisions that appear in this edition are those of the general articles, Barbital and Barbital Compounds, Digestive Enzymes, Cod Liver Oil and Cod Liver Oil Preparations, Ovary, Pituitary Gland, Radium and Radium Salts, and Serums and Vaccines. Among the new preparations descriptions of which appear for the first time in this edition are: Bismarsen, which is sulpharsphenamine bismuth; Dial-Ciba, which is diacetylbarbituric acid; Calcium Gluconate-Sandoz, a more palatable and less irritating preparation of calcium; Atoquinol-Ciba, a cinchophen derivative; Pitocin and Pitressin, solutions respectively of the oxytocic and pressor principles of the pituitary gland; Viosterol (the Council name for irradiated ergosterol) in the forms of Viosterol in Oil 100 D, which is irradiated ergosterol dissolved in vegetable oil; and Cod Liver Oil with Viosterol 5 D, which is cod liver oil with its vitamin D potency enhanced by addition of viosterol. While these new preparations (with the possible exception of Viosterol) do not constitute major additions to the physician's armamentarium, each one gives promise of relative usefulness, and the physician who desires to keep abreast with the progress of therapeutics will familiarize himself with them as well as with the many other new preparations described in this valuable book.

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1929. With Comments that have appeared in The Journal. Cloth. Price $1. Pp. 81. Chicago: American Medical Association, 1930.

This is the volume in which the Council annually collects the reports on articles found unacceptable during the year. This edition contains also several interesting preliminary reports on preparations which show promise but for which the evidence is not yet sufficient to justify acceptance by the Council. Reports are given on the following products rejected by the Council: Anayodin, claimed to be iodoxyquinolinolin sulphonic acid (chiniofon) but marketed under a non-informing name without adequate statement of composition and with unwarranted therapeutic claims; Antiustio, an unscientific mixture marketed under a non-descriptive name with unwarranted therapeutic claims; Kerasol and Keraphen, unoriginal products marketed under non-informing names; Sodiphene, an unoriginal alkaline phenol preparation marketed under a proprietary name with unwarranted therapeutic claims; Borocaine, procaine borate under a proprietary name; Quicamphol (Transpulmin), a quinine preparation for intramuscular injection in the treatment of lobar pneumonia; Toxogon, a preparation of inadequately declared composition marketed under a therapeutically suggestive name; Intramuscular Iron Arsenic Comp. (No. 201) and (Intravenous) Iron Cacod. and Glycerophosphate (No. 202), two irrational and unscientific mixtures exploited with emphasis on the numbers. Other rejected products are: Ovoferrin, Tamerici Salts, Elixir Kacyan-McNeil, and Tablets Kacyan-McNeil. An authoritative article on serum disease and serum accidents by MacKenzie and Hanger is of considerable interest and timely importance.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—Assistant director of one hundred bed county tuberculosis sanatorium. Address MINNESOTA MEDICINE, D-91.

WANTED—Locum tenens work for August and September. Three years' hospital experience since graduation. Twin Cities references furnished. Address D-93, care MINNESOTA MEDICINE.

POSITION WANTED—X-ray technician; four years' experience in large hospital, desires position in clinic, hospital or doctor's office. Available immediately. Address D-92, care MINNESOTA MEDICINE.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association. Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

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PRESIDENT'S ADDRESS*

S. H. Boyer, M.D.
Duluth, Minnesota

A GENERATION ago the muck-rakers were attacking corporate business. Their destructive criticism succeeded in working a great deal of serious inconvenience to the business methods of that time, but the ultimate result was to popularize still greater business combinations and the muck-raker was thereby out of a job. He is an ubiquitous fellow, however, and always trying to smash something. He is destructive, never constructive. Latterly he has been chiefly concerned with the medical profession. For years past he has been picking it to pieces and tearing it to tatters. Were it not made of such substantial fabric it would have met its Waterloo long ere this and the field of healing would have been abandoned to fakers and quacks.

Nevertheless there are faults and flaws in medicine just as in everything else. As a profession we must be grateful to him who points them out to us, and likewise glad to enlist assistance in correcting whatever evils or defects there may exist. It so happens that the science of medicine in seeking the cure for disease first tries to learn the causes thereof. This approach to the problem offers always the best hope of correct solution. Before proceeding farther let it be clearly understood that the economico-social problems of medicine are not isolated. They are not the property of medicine alone. They are not due to any failure of duty or responsibility on the part of the profession and they are inextricably interwoven with the same order of problems of all other social and industrial groups. The solution of our problems can come only with the solution of these related problems of all groups, for the economico-social problems of medicine are in truth the problems of society itself.

Among the charges brought against us are those of uneven distribution of service, inequality of service and excessive fees, the latter more especially in relation to the patient's income. Reference is made to the group whose earnings do not exceed $2,500.00 per annum and does not consider the indigent.

Not long since, it was pointed out in an article dealing seriously with the uneven distribution of medical service that in New York City, just around the corner from a great medical center, there was discovered a number of untreated cases of diphtheria. Wonder was expressed that, though living almost in the shadow of a center where medical skill of the highest order obtained, still these people were neglected. The article went on to blame the medical profession for failing to reach and treat these cases. Uneven medical distribution was given as the reason for the failure. Paralleling this type of complaint is the widely heralded statement, with convincing statistics, that there is a dearth of doctors in the rural communities. It has been shown that in certain states and localities there are thousands of people without available medical service. Both of these citations touch upon the uneven distribution of medical service. Should inquiry be made it would be found undoubtedly that in the first instance ignorance, if not mental incompetency, prevailed and that those who should have been most concerned did not know enough to know that sickness existed, might be serious, could be cured and that aid was available. Most of us have encountered the like in our own experiences, in rural as well as in urban communities. You must blame the social worker, not the doctor, for such failures.

The second citation is best answered by pointing to the fact that in rural communities that are prosperous, in such as exist in Minnesota and

*Presented at the Annual Meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 14, 1930.

adjoining states, there is no shortage of doctors. We may confidently predict that the five year investigation of the Committee on the Costs of Medical Care will prove this statement to be correct. No doubt there is a shortage in the abandoned farm districts and in the sparsely settled frontier fields.

While we are thinking upon this subject it is only fair to call your attention to the fact that the young folks leave the farms and the old folks do too, if they can, when the farm proves unattractive and unprofitable. That isn't the fault of the medical profession, it is the fault of our economic and social systems coupled with the inherent insufficiencies of humanity. A good farmer won't move his family into a territory where there are not good roads, good schools and churches. A doctor cannot be expected to do differently. Your merchants, tradesmen, white collar men all locate in prosperous places, and so do doctors. None of them except the social worker goes to the slums of the cities and the least prosperous of the agricultural localities to earn a living. The social workers are rendering a valuable social service in choosing this field, but they would be of far greater service if they strove to remove the causes of such conditions instead of attempting to correct the effects.

Poverty and illiteracy have much to do with insufficient and futile medical care. People must have comfortable living quarters, wholesome food, suitable clothing and a modicum of intelligence to benefit to the fullest by medical service. Without these, both preventive and curative medicine are of comparatively little value. It is true the very poor get more hospital service than do those with modest incomes. It would be impossible to treat the former properly in their homes. But upon leaving the hospital they return to the same squalid and unhygienic conditions of life, thus rendering futile a great part of the service they have received. The latter can be taken care of in their homes, and they are taken care of there, and well. Their homes are mostly favorable to health, therefore medical service in their case is not futile. Moreover, let it be said that not infrequently wealthy people, owing to stupid vanities and poor judgment, succeed in selecting for themselves very mediocre professional service. So let us explode the myth that the "very poor and the very rich alone receive adequate medical service."

That great class, including the $2,500 a year man and lesser wage earners, are the most numerous of our people. They are reasonably enlightened, housed, clothed and fed. The home and family life of many of them is charmingly beautiful. Their children, reared in an atmosphere of decency, frugality and self dependence, come to fill positions of trust and responsibility and are a challenge to the admiration and respect of the entire community. They become an honored example to be followed by vast numbers upon whom fortune has smiled more indulgently but, after all, less favorably. The great majority of the medical profession render a reasonably high average of service for a reasonable remuneration to this class of people.

The incidence of sickness is uneven; therefore the cost is unevenly distributed. The burden falls heavily upon a limited number of the sick population and lightly upon the rest. The source of complaint as to costs of sickness is to be found among the limited number who bear the heavy end of the burden. Thus it is to be seen that the trouble does not arise within the medical profession nor is it confined to the field of sickness only. Every family has unlooked for and unusual expenses at some time or other. With one family it will be a fire, with another a wedding, with another a lost job and continued overhead, while with still another it will be the cost of sickness and perhaps death and burial. When we consider this problem we must do so in relation to other costs and their distribution. We must not lose our sense of proportion.

It has been stated that the so-called middle class does not receive adequate medical service because of prohibitive costs. This leads to the query, "What is meant by the term adequate?" If those who use that term mean that every individual when ill shall be subjected to all the technical tests, a clinical examination by an expert clinician supplemented by examinations by a long train of specialists, then we will have to admit they do not. Furthermore, they never will, and if they did it would not prove to be adequate nor suitable. That kind of service, mass service if you please, is an ideal which, like the rose, has many thorns. Now, if by "adequate" we mean services rendered by well trained doctors such as have been graduated from our Class A schools for at least two decades last past and whose integrity and scholarly

habits are above reproach, then we must assert without fear of contradiction that adequate service *is* rendered, or is at least available.

Assuming for the sake of discussion that the costs of service are prohibitive, then we must determine why and proceed to place the blame where it belongs. To begin with, doctors' fees in Minnesota are reasonable excepting in isolated instances. This statement will be substantiated undoubtedly when we have the report of the Commission on the Costs of Medical Care. This lets the doctor out and an explanation for the complaint of high costs must be sought for elsewhere. There are many factors worthy of consideration, but only a few will be discussed. One which may be mentioned in passing is the nearly universal custom of our people to get, not that which they ought to get, but that which they most desire. It is ingrained in human nature to rebel against being compelled to accept something not wanted. People do not want sickness. They instinctively rebel against it when it comes. The expense incident to it, no matter how slight, is looked upon as a hardship, so they resent having to meet it even though, paradoxically enough, they settle with their doctor, hospital and druggist cheerfully and often with a genuine spirit of gratefulness. But, they complain of the very existence of such an expense just as they complain about having to pay taxes. The complaint has become accentuated because of the comforts and luxuries available and enjoyed by nearly all. It is due largely to the fact that there is a desire to use the money, and it is so used, for something else.

It is permissible to state that business and industry are very largely to blame for the complaint against the cost of sickness; for business and industry, while preaching thrift, have been inculcating habits of luxury and extravagance among the people. They have broadcast the slogan, "You must spend money to make money." While that is sound advice when the spending is for purposes of investment and trade, it is on the other hand most dishonest and demoralizing advice when applied to the purchase of articles that depreciate in value from the moment of acquisition. Business and industry have combined to sell goods, as is their function, and they sell without due consideration to the ability of the ultimate consumer to pay. How else shall we interpret the familiar advertisement, "You don't need any money, your credit is good?" Also the constant urge to "break down sales resistance" can mean nothing but utter disregard for the thrift of the buyer.

Partial payment buying has its advantages and has made many comforts, luxuries and necessities possible to us all, but it is not an unmixed blessing. Temptation set in the path of the possible buyer by the high pressure salesman cannot be successfully resisted by the average person. Consequently, the buying public has become heavily laden with personal indebtedness. When men are struggling under a burden of debt any compulsory additional burden brings resentment and protest. This holds whether the additional burden be due to unwelcome sickness or to the necessity of replenishing the coal bin for the winter. It is not the fault of the medical profession that the people are in debt and have difficulty in meeting their obligations. Their indebtedness is due to the greed and short-sightedness of business and industry coupled with the natural weakness of human character. Business and industry have not yet learned how to know when the purchasing power of the people is becoming strained, or they have not yet developed sufficient intelligence to enable them to regulate their production and distribution with such balance as to maintain a natural demand, steady consumption and a maximum of steady employment.

This brings us to the problem of unemployment in relation to the cost of sickness. When men are idle they complain most bitterly of illness and its possible costs. They resist the incurring of debt, not knowing where they are going to find the means with which to pay.

The reduction of purchasing power is only one of the many causes for unemployment. The business world stands in close relation to it. The merging of business interests, the spreading use of labor saving machinery, the chain store movement and all similar devices have sought to effect a saving at the expense of the numbers employed and without any evidence as yet of absorption of the unemployed into other occupations. These efficiency devices mean increased production at less cost but incidentally, in company with indebtedness, they sacrifice the market by reducing purchasing power.

Another field in which industry has engaged to benefit mankind is the "safety first" move-

ment. We doctors have been enlisted to aid in this beneficent movement and right royally and loyally have we responded to the need, glad indeed if we can aid in preventing human suffering. But the movement is not an unmixed blessing any more than is the partial payment scheme, for it appears that indemnity insurance companies, with an eye to business, have discovered that modern machinery is very dangerous to men who can no longer keep in step with the rapidly moving and untiring machine. Upon careful study it has been found that the age at which man does not move in unison with the machine is for all practical purposes about forty and up. These same astute companies have also learned that men who have been injured in certain degrees, or employees who have begun to suffer slightly from the inevitable breaking down processes of life, or who show signs of requiring a lightening of their labors from any cause, are no longer safe to have around the shop. They might get hurt. Well, what to do? The simplest thing in the world of course is to raise the premium paid by the employer if he persists in having such risks around. Or, what amounts to the same thing, a reduced premium will be charged if the employer retains in his employ only men of sound body and suitable age such as are fit to meet the machinery requirements. Oh! the safety first campaign in industry is a wonderful thing in some respects. It seems that it is far better for a man to starve to death while hunting a job that can't be found than it is for him to be hurt in the pursuit of duty and at the expense of an indemnity company. So there we have the source of another goodly number of idle men who will very justly complain of doctors' bills even though they be of trifling amount. It isn't the doctor's fault that workmen are out of work. Neither is it the doctor's fault that office men are out of work in the great cause of efficiency and that for the same reason the small banker and independent retail store men are out of business. The doctor knows that all these people who suddenly find themselves without means of livelihood are going to have sickness along with their other troubles and he stands ready, as he always has, to step into the gap and aid in stemming the tide of trouble.

That the greater the number of people who are removed from gainful occupation, the greater will be the medical and tax costs of those who are so employed is a self evident fact requiring no elucidation. The first point at which the public and the private charities will have this fact brought forcibly to their attention will be in the field of old age pensions. The question of old age pensions has engaged the attention of statesmen, politicians and organized charities for a considerable period of years. All seem to have agreed that sixty-five is the age for retirement. They will have to reduce that limit to the earlier age of forty if the present trend in the employment field continues. A disturbing thought intrudes itself at this juncture. Men at the ages of forty, forty-five and fifty are still possessed of power of procreation. Our pensioners will be fathering children born in poverty to be provided for out of our poor funds. This increase will make nice additions to our population. Another serious health problem will develop in association with the old age and idle men's pension system. Idleness fosters degenerative disease and we may expect a whole new crop of arterial disorders to appear far ahead of their normal time. Not only will physical decay begin at an earlier age than heretofore but cerebral arteriosclerosis with its mental failure will become much more prevalent than it is at present. What effect this may have upon the average age of life we are at liberty to guess. It is reasonable to suppose that the work that has been so successful in saving the lives of our children, and thereby raising the average age of life, will be neutralized, in so far as the latter gain is concerned, and the average reduced.

One more cause for complaint is the occasional predatory physician. The man who has an hypertrophied opinion of the value of his services, who has no sense of his social obligation, who charges working people fees out of all proportion to their ability to pay. He is a disgrace to the profession. If he cannot afford to treat the common people for reasonable fees then let him confine his activities to the wealthy classes, if the latter will have him, and relinquish what to him is an unprofitable practice to his equally competent but more honorable brothers. That "God tempers the wind to the shorn lamb" is something beyond his comprehension.

It would appear, then, that chief among the causes giving rise to the complaint against the cost of sickness are poverty, ignorance, moronic

mentality, greed for gain, extravagance, debt, unemployment and the occasional predatory physician. But no matter what the causes are, the plain fact is that they do exist. The problem is to know how to cure these festering spots on the body politic. To cure them will be to remove most of the ills which afflict our present civilization. Humanitarianism, which aims to tide people over difficult periods and to place them in suitable positions for self support, is commendable and helpful but certainly not curative. Paternalism, which is nothing other than governmental dictatorship applied to the personal activities of the private citizen, is worse than useless. It would encourage the support of an ever increasing number of idle people, tend to destroy initiative and to build up class distinctions. It would accentuate the trends of the rich getting richer and the poor getting poorer. Pick up your dictionary and study the definition of paternalism. Then turn to your encyclopedia for a detailed study of its origin and history. With a full understanding as to its significance you will stand aghast as you contemplate the riot it is running in this country today. You will feel the need, as never before, of a solidly united profession to contest this monstrosity at every step of the way. Socialism, a term that has been used most loosely, may be defined as a political philosophy which contemplates the substitution of coöperation for competition with an equal distribution of the proceeds. Well, if all men were created equal, physically, mentally, morally and spiritually, perhaps socialism might be made to work. Inasmuch as all these qualities obtain unequally among us, it ought to be manifest that socialism cannot work. It is the very inequality of mentality that makes possible the thought on the part of some that socialism is practicable.

The solution of our problems rests in a recognition of the principle that every individual, every organized or unorganized group, whether rich or poor, owes certain obligations to society. You cannot single out any special group, whether it be the profession of medicine or some other body, and burden it down with duties to be performed, willy nilly, for the benefit of another group and expect relief. Such a course is paternalistic and, so far as medicine is concerned, oppressive; so far as the people are concerned, demoralizing in the extreme. While recognizing the principle of social responsibility we must none the less remember the importance of individual privilege and personal freedom. These must be preserved or the nation fails.

What the attitude of the medical profession shall be in relation to the changes taking place about us affords food for serious thought. That paternalistic encroachments have taken place is only too apparent. Especially is this true in foreign places, so much so indeed that the movement appears to be well nigh world-wide in its scope and its tentacles are reaching hungrily into our own country. It has gathered such impetus now that only a solidly organized and militant profession will be able to ward it off or so modify it as to eliminate its most pernicious features. The profession must be prepared to meet contingencies as they arise and make proper adjustments. Any trend or action tending to discourage personal initiative must be checked. Fair compensation, commensurate with the kind and quality of services rendered, must be maintained. We must "render unto Caesar those things which are Caesar's," but Caesar must render unto us those things which are ours.

The profession will not be able to successfully combat the dangers that threaten it unless it respects itself. To respect itself it must be deeply interested in its work. The degree of this interest can be measured by the general average of ability manifested by the profession in its general affairs. Thanks to the combined influence of the association of American Medical Colleges, the Council on Medical Education of the American Medical Association and the various state boards of medical licensure, the average training and inherent ability of the physician has steadily risen within the last twenty-five years. There is every reason to believe that present standards will be maintained and that the excellent quality of mentality now so apparent in the ranks of the profession will continue and become more apparent as time goes on.

It is not conceivable that men of that type will permit themselves to be placed in a position of servitude, so borne down with petty duties and so poorly remunerated that there is left neither time nor means with which to keep their knowledge and skill abreast of the best of their time. The public are insistently demanding the best in medical skill. They cannot get it by reducing the medical profession to a position in which it

is neither happy, comfortable nor self-respecting.

Our duty to ourselves and to society is to continue to maintain our high standards of efficiency; to continue, individually and collectively, to minister to the needs of sick humanity wholeheartedly and with broad sympathies, just as we have been doing since time immemorial; to continue to keep ourselves banded together for the purpose of maintaining our high ideals. The old family doctor is not gone from our midst. His pill boxes, his saddle bags, his faithful old nag are gone, but the spirit that was his still lives and carries on. Human nature does not change. It craves sympathy and understanding today just as it did fifty and a hundred and a thousand years ago. The old family doctor because of his indomitable will and great purpose in life survives and has steadily adopted improved methods of therapy as rapidly as science has made them available. He still lends a sympathetic ear, still pours oil on the troubled waters, still advises and guides in matters so intimate that none other can be admitted to confidence. Let us not mistake the discarded clothing and accoutrements of the old family doctor for the man himself. Let us ever cherish the ideal of him, so indelibly and picturesquely stamped upon our memories; let us emulate his hardy and humane virtues, always.

And now, in conclusion, we may say that as a people we are the victims of our own intelligence and insufficiencies. Our intelligence has enabled us to pry into and learn the secrets of nature and we have adapted them to our own uses. We have developed all sorts of useful and enjoyable contrivances. We have shortened space and made time of no consequence. We have rendered life more complex but altogether more comfortable. But we have not yet learned how to use our newly discovered good fortune rationally. There is no similar experience in the history of the world, one in which a whole nation of people have become mad with a superficial material prosperity, to which we may turn for guidance. Certain fixed and immutable laws of life and conduct exist, it is true, but in the exhilaration incident to our material gains we have forgotten the spiritual and philosophical. We are caught in the mad onrush of what we call progress and our insufficiencies cloud our mental vision. We see dimly, if at all, into the significance of the turmoil in which we live. We vision problems but we fail to determine just what they are or how to solve them. We are caught in the current of a turbulent stream, being swept on whether we will or no and we haven't the faintest idea as to where we are going. As we go we struggle to keep from going under, enjoying the struggle with the exuberance of youth, but hoping nevertheless that calm waters are just ahead. When we reach them we shall have had experience, perhaps we shall have been chastened thereby, and we shall then have time for retrospective thought. We shall have gained perspective.

The prehistoric American may have been the last of a decaying race, or he may have been in the infancy of his development. We do not know. We do know that we are here in his place, in an entirely new and different world. We do not know whether, in relation to our modern life, we really are growing or beginning to go backward. The signs of decay are not wholly lacking, but let us hope that the signs of our social and political life are correctly interpreted when we speak of ourselves as an adolescent nation. We at least flatter our vanity when we accept that designation, for it presages future growth and development.

PRIMARY CARCINOMA OF THE LUNGS AND BRONCHI*

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IT HAS happened that I have encountered primary carcinoma of the lungs and bronchi with increasing frequency during the past few years, both in private practice and on my service at the Ancker Hospital. In fact, since I have been interested in this condition there is scarcely a month goes by without word of another primary lung cancer.

In checking up at the Ancker Hospital we could find only two cases where death had been caused by this type of cancer from 1912 to 1917, while from 1918 to the present time there were sixteen such deaths. No doubt there were more; some not diagnosed, others diagnosed but not submitted to autopsy examination and hence not proven cases as to primary or secondary growth.

This apparent local increase is noted by many authorities both in this country and Europe and some of the references as to its incidence are of interest.

Moses Barron, reporting from the records of the Department of Pathology at the University of Minnesota, states that no cases were found prior to 1912; that there were four cases or .2 per cent from 1912 to 1918 and nine cases or .9 per cent from 1919 to 1922, among a total of 4,362 autopsies, with the greatest increase during 1918 and 1919, which was the peak of the influenza epidemic.

His collected statistics in 1922 indicate also a gradual increase from .057 per cent in 1878 to .46 per cent in 1916, practically ten-fold.

Various hospital reports in this country and Canada show a marked increase in percentage of these carcinomata in total autopsies, as well as of lung carcinomata to total carcinomata since 1900, with the greatest increase since 1915.

London hospital statistics show .51 per cent in 1907, increasing to 2.05 per cent in 1925. German statistics show an average increase very similar to the foregoing with a corresponding percentage increase in lung cancer to total cancer, and generally conclude that there has been a definite increased incidence of primary carcinoma of the lungs in recent years.

Berblinger, in Jena, where the majority of deaths are followed by autopsies, found a definite increase of primary lung cancer in recent years.

Erdheim, of Vienna, where practically all deaths are followed by autopsy, states that there is a marked increase since the World War.

Taking for granted the increased incidence of primary carcinoma of the lungs it is of considerable interest to determine, if possible, if this increase is apparent or real.

The following observations favor the apparent increase:

1. Increased human longevity. The average length of life, prior to the fifteenth century, is said to have been eighteen years. This increased to forty-five years at the beginning of the nineteenth century. At present it is about fifty-seven years, ten of which have been added during the last two decades, with the resulting increase in the "cancer age."

2. Alterations in pathological classification as the result of which previously termed sarcomata are now classed as carcinomata.

3. Improved diagnosis with the resulting increase in autopsy check.

4. Improvement in sociological conditions leading to larger attendance at hospitals.

To offset these arguments favoring the apparent increase only, one can say:

1. The percentage of primary lung cancer compared with the total cancers has increased three or four times.

2. The lung tumors formerly classified as sarcomata are really rare.

3. A great number of lung carcinomata are still found only at autopsy.

4. The hospital routine of the Old World has not varied to this extent in the last twenty years. Consequently one is impressed with the thought that this increase is actually a real one and that it is in some manner due to etiological conditions.

ETIOLOGY

When the cause or causes of cancer in general become known we will be better able to explain this marked increase in primary lung cancer. However, since this increase recently over other

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forms of cancer we may look for those etiological factors of a chronic irritative nature which themselves have shown an increased incidence in recent years.



Fig. 1. Case 1. August 11, 1926. Large tumor involving almost entire right lower lobe; no evidence of fluid or metastases.

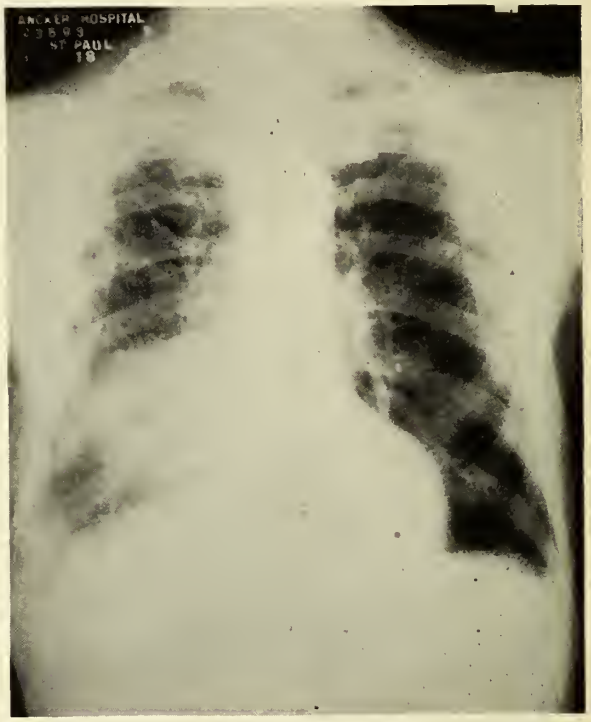


Fig. 2. Case 2. March 18, 1929. Large fairly localized tumor extending from the right border of the heart into the base of lung, with probably atelectasis of the lower lobe. No fluid or metastases.

These may be grouped as: (1) Bacteriological; (2) chemical; (3) mechanical; (4) possibly radiological.

The chief bacteriological factor is probably influenza. Statistical evidence points to a definite increase of lung cancer following the great epidemic of 1918 and 1919 and histological examination by various authorities (Askanazy-Goldzieber and Myer) suggest changes resembling precancerous epithelial proliferation in the lungs in influenza.

Chronic bronchitis, bronchiectasis, fibroid pneumonia, healed tuberculosis and syphilis may predispose. The majority of observers everywhere note the great increase in lung cancer during and after the epidemic of 1918 and 1919.

Chemical and mechanical irritation is largely by way of inhalation. Long continued inhalation of tobacco smoke must be considered, although as yet there is no definite proof of this. Road dust, containing tar, may prove to be a potential factor.

Kimosa has produced lung cancer in rabbits and guinea pigs by insufflating tar through a tracheotomy wound in his experiments. Half a million tons of tar are used annually on the roads of this country and the fact that carcinoma of the lung is very rare in places like Hong Kong and Singapore where the roads are not tarred is suggestive. The fumes of motor exhaust are mentioned by many, but as yet there are no proofs. Workers in mines and other dusty occupations in certain regions show a definite increased incidence; thus, in Schneeberg, Saxony, it was claimed that 50 per cent of the old miners died of lung carcinoma. The Saxony Cancer Committee *x*-rayed 154 cases of long-time mine workers; twenty-one of these died; thirteen of these deaths were from lung cancer, as confirmed by autopsy, and two were diagnosed as such but did not come to autopsy. This was in marked contrast to the rest of the population, in whom there was practically no lung cancer. The arsenic contained in the cobalt and bismuth mined was thought to be the principal etiological factor.

Finally, "gassing" in military service is mentioned as being a factor in the marked increase since the war.

PATHOLOGY

Many observers classify primary lung cancer as arising from: (1) The columnar epithelium lining the bronchi; (2) mucous glands of the bronchi; (3) squamous alveolar epithelium.

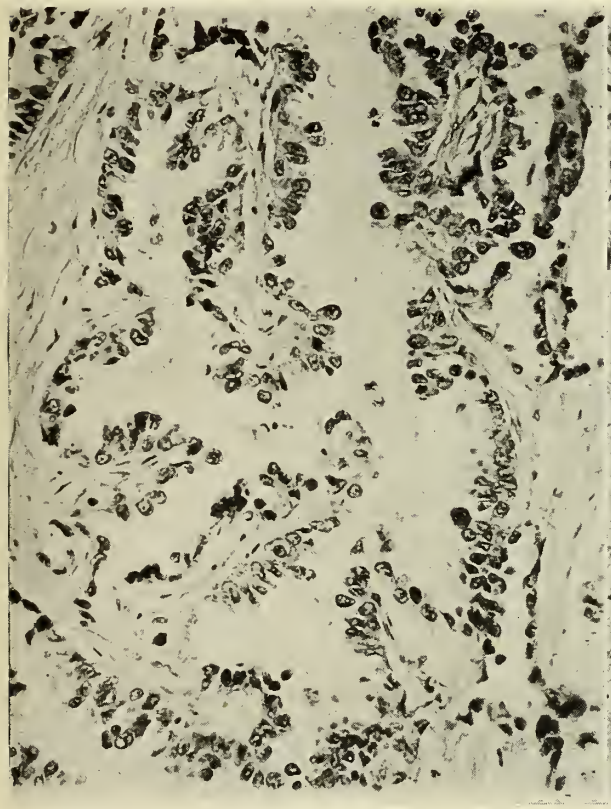


Fig. 3. Case 2. Microscopic section of lung tumor. Marked tendency to glandular structure with various types of epithelial cells.



Fig. 4. Case 2. Microscopic section of liver with similar glandular formation and massing of epithelial cells.

This distinction is difficult in many instances as the type is largely determined by the character of the cells composing the tumor mass and these may vary from squamous in some portions of the tumor to cuboidal in others. Metaplasia is easily produced in these cells by chronic inflammation and is spoken of by Hanseman as "histologic accommodation." Most authorities believe that the great majority of these tumors arise in the mucosa of the bronchi. Erdheim in 1926 stated that they were all bronchogenic but that they were prone to metastasize in the lung.

1. The type arising from the bronchial epithelium may vary greatly in size, color and consistency. It may remain as a small projecting mass in the bronchus and yet may have metastases to the liver, kidney, adrenals, etc., or it may grow into the lung tissue and displace it even to the extent of an entire lobe. Occasionally its growth will be found between the lobes only, and overlapped by them. In the late cases in which the tumor mass has attained large size and has caused much distortion it may be difficult to determine the exact point of origin in the bronchus but careful search will usually reveal a fungoid ulcerating growth in its wall. Sooner or later there is obstruction to the bronchus; if this is partial there will be dilatation of the distal portion of the bronchus from retained secretion and bronchiectasis results which may go on to abscess formation. If obstruction is complete atelectesis results. Broncho-pneumonia finally complicates the picture and is usually the immediate cause of death.

2. The type arising from the bronchial mucous glands is rare and usually limited chiefly to the walls and especially the sub-mucosa of the bronchi. These tumors and their metastases are characterized by excessive mucous secretions and are more or less slimy in appearance. I have not seen this type but Klotz reported two cases and Weller states that they are not infrequent.

3. Those arising from the pulmonary alveoli may be diffuse, involving the larger part of the lobe, or multiple and nodular, involving a single lobe or the entire lung. Ewing states that these masses are often composed of cuboidal pleomorphic epithelial cells, simulating cells found in the tumor arising from bronchial mucosa. There is, therefore, great possibility that many of this type are metastatic and are primarily bronchiogenic, especially if they are multiple and of rapid growth. Pleural involvement directly by extension or metastasis, with pleural effusion, occurs in about one-half of the cases, and approximately one-third of these effusions are bloody. Rapid recurrence of this bloody fluid is characteristic. Erdheim reports elevation of the diaphragm frequently and thinks it due to paralysis resulting from phrenic nerve involvement. It is quite possible that this may also be a result of extensive lung atelectasis.

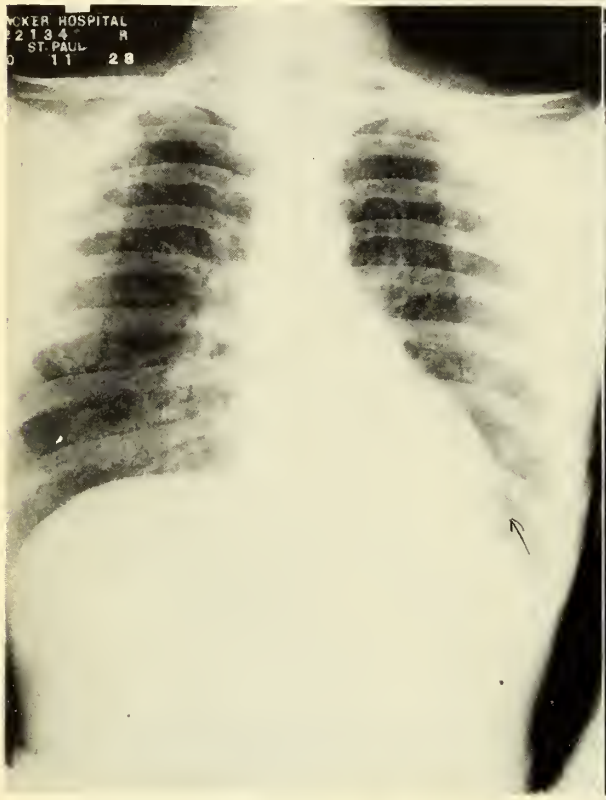


Fig. 5. Case 3. October 11, 1928. Apex of tumor just visible beyond heart shadow but not interpreted as such at this time.

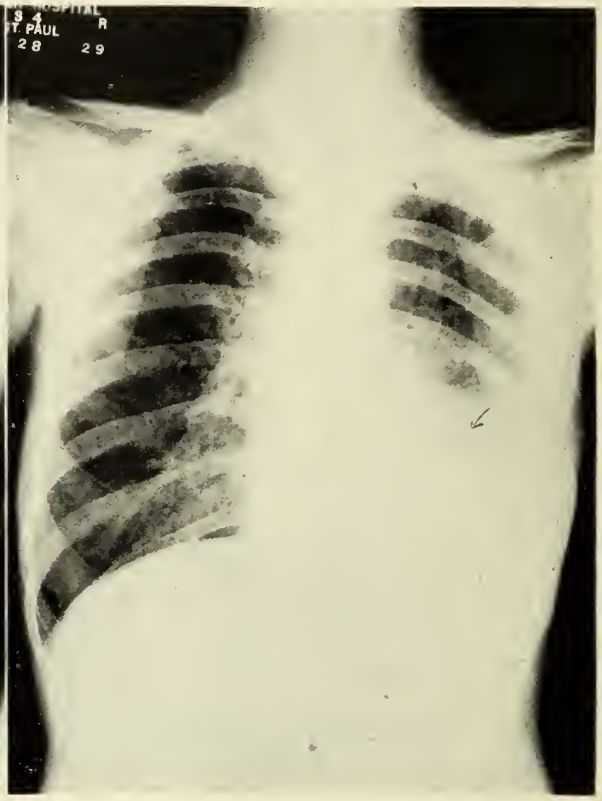


Fig. 6. Case 3. October 28, 1929. Large diffuse tumor mass. Same case one year later.

METASTASES

Primary carcinoma of the lung is very prone to metastasize, and its metastases are widely distributed. This is due to the fact that the tumor growth is slow, allowing time for metastases before death, and also because of the abundant supply of blood and lymph vessels in this region. The regional glands are most often involved and the extrathoracic glands next. Of the viscera the liver and suprarenals are the favorite sites with the pancreas next. The parietal pleura often shows metastatic involvement but may also suffer from direct spread. The vertebral column and according to Erdheim the proximal ends of the long bones, especially the femur, are frequently affected and are often overlooked at autopsies because of the difficulty in obtaining consent to osseous dissection. Of unusual interest is the high percentage of brain metastases as compared with cancer elsewhere in the body. This is explained by the fact that the cells from the lung are carried by the blood stream directly to the brain while metastatic cells from elsewhere in the body are largely sieved out by the lungs and never reach the central nervous system. Because of this marked tendency to early and frequent cerebral metastasis the first marked symptoms may be those of brain tumor and may easily

undergo operation. Occasionally metastases occur in the lung apart from direct spread and may be mistaken for the primary growth. The rapid increase in size and number speaks for metastases.

SYMPTOMS AND SIGNS

Age and Duration. The majority of the instances occur between the ages of forty-five and sixty-five and the average duration is seven months. The youngest proven case by Simpson was thirteen and the oldest seventy-seven. The shortest duration, reported by the same author. was three days, while he reports four cases living four years. Males predominate over females three to one.

The first symptoms may come on suddenly with hemorrhage or may resemble acute pleurisy or pneumonia, or they may be gradual in onset with cough, pain and dyspnea, and may be treated for bronchitis over a period of months. Finally this cancer may be entirely latent and be manifested by its metastases in the brain, bones or viscera.

The physical signs are always confusing at best. In early bronchial tumor, with most distressing symptoms, chest examination may fail to explain them. On the other hand, there may be present all the signs of broncho-pneumonia, atelectasis, bronchiectesis, lung abscess and pleural exudate, depending on the location, size and complications of the tumor.

Cough is the most frequent symptom but may not appear at all and may or may not be characteristic. However, recurring paroxysms of cough with intense discomfort, pain and dyspnea ending with only a small amount of mucous, sometimes blood-tinged and continuing day and night should be strongly suggestive of bronchial cancer, especially when this occurs in an individual in the cancer age.

Sputum is usually scanty and mucoid early, becoming muco-purulent or bloody and more abundant as infection and complication supervene.

Pain next to cough is the most important and the most frequent symptom. It may be of all grades of intensity and of various types. The site of the pain is usually the chest but may be referred to the neck, back, abdomen, legs or arms and may be due to various causes, as nerve pressure, pleural irritation, pericardial inflammation and cord and nerve plexus involvement.

Wasting occurs in 50 per cent of the cases and may begin early.

Fever is often found early, though low grade until complications arise.



Fig. 7. Case 3. Cross section left lung six weeks later.

Dyspnea may occur early with cough, later it is influenced greatly by the degree of obstruction to the bronchus or pressure on the lung from the tumor growth, pleural fluid, etc. It may occur in paroxysms resembling asthma.

Less constant symptoms are cyanosis, dilated veins due to pressure in the mediastinum with or without local edema of the head, neck or upper extremity. Laryngeal paralysis and dysphagia may occasionally occur as may unequal pupils and occasionally clubbing of the fingers or other signs of pulmonary osteoarthropathy in lingering cases.

Leukocytosis much over 12,000 is only present in the later cases and is due then to an associated infection.

DIAGNOSIS

This is often difficult and many so-called "silent types" are easily overlooked and are only found at autopsy after their metastatic activity in the brain, bones or other distal parts has become the center of interest to all concerned.



Fig. 8. Case 3. Low power. Microscopic section.

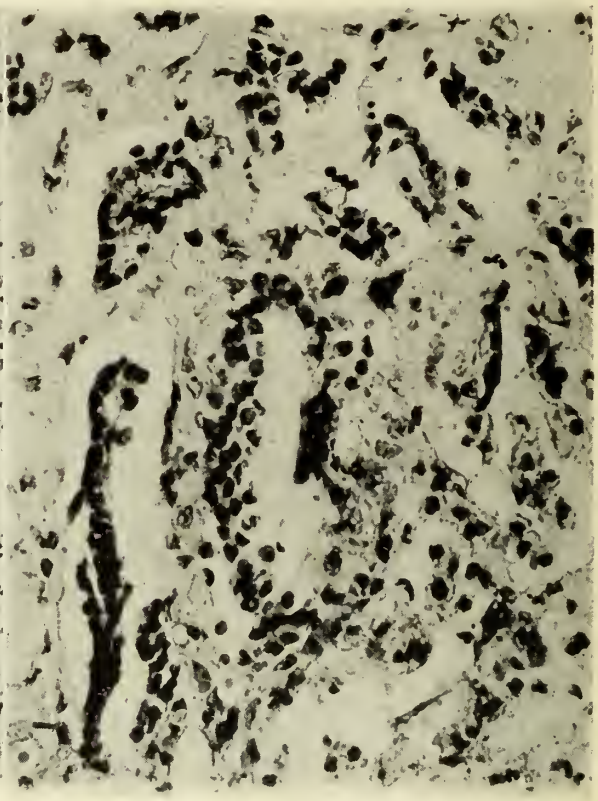


Fig. 9. Case 3. High power. Microscopic section.

A careful history will usually bring out one of the cardinal symptoms and focus attention on the lungs so that the course and physical signs, together with the special examination by the bronchoscope, *x*-ray and intrabronchial injection of lipiodol will give conclusive evidence. The sputum will occasionally furnish the diagnosis with tissue shreds. Biopsy through the bronchoscope, if possible, gives the most conclusive evidence. This is also true of superficial glandular biopsy, but, unfortunately, while tuberculous glands in the neck usually mean very little pulmonary involvement, in the case of carcinomatous glands, autopsy shows extensive lung lesions. While it often happens that the primary growth in the bronchus is overlooked and its metastases discovered, so also certain metastatic lung tumors are called primary because their inconspicuous parents in the thyroid, thymus or prostate are slower of growth than their offspring.

Physical signs are often indefinite early; generally speaking malignancy of the lung should be considered when either incessant cough, pain, dyspnea or blood-tinged sputum occurs in an individual of the cancer age without satisfactory explanation. Repeated *x*-ray films, both anterioposterior and lateral should be had, and bronchoscopic examination should be insisted upon after first ruling out aortic aneurysm. Bloody pleural fluid means malignancy in practically all chronic cases not associated with trauma.

TREATMENT

The treatment for this condition demands early diagnosis and since carcinoma of the lungs is usually carcinoma of the larger bronchi, local cautery and possibly radium by a skillful bronchoscopist offers the best hope. Brunn found there were at least twenty-eight cases of lobectomy and other surgical interventions in the literature. Sauerbuch had one patient living five years and another three years after operations; obviously the cases must be carefully selected.

Deep *x*-ray therapy is useful at times to relieve pain, but, while subjectively of benefit, progress is not affected.

I have selected the following three case reports which represent various clinical pictures with *x*-ray films, slides and gross specimens of the last two:



Fig. 10. Case 3. Secondary hypertrophic osteo-arthopathy; clubbing of fingers with spurring of terminal phalanges and periosteal proliferation along carpal and metacarpal bones.

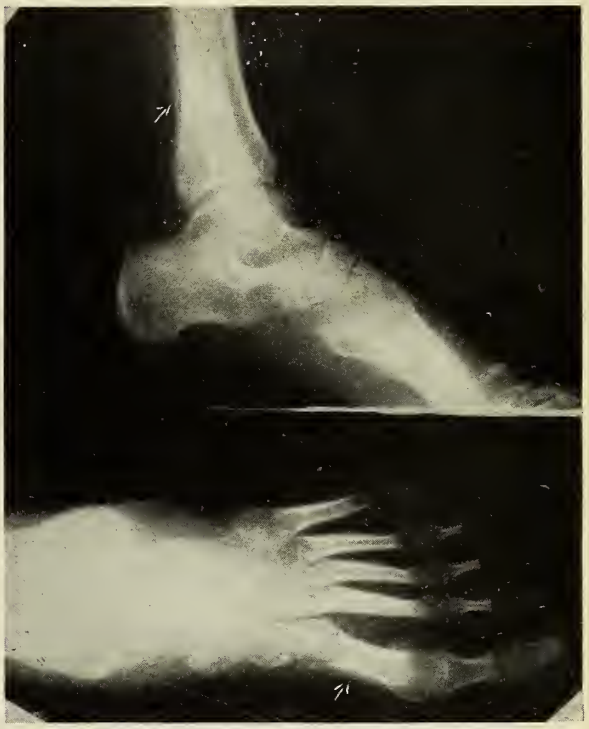


Fig. 11. Case 3. Similar changes in the foot.

Case 1.—A male, aged 61, by occupation a printer, was first seen November 15, 1926. He complained of severe paroxysms of cough, slight dyspnea on exertion and pain in the chest present for the past four weeks with loss of ten pounds in weight. The cough was more less characteristic in that it occurred in frequent prolonged paroxysms with much dyspnea, moderate cyanosis and pain in chest, ending finally with the expectoration of a small amount of sticky, mucoid material which was occasionally blood-tinged. He also complained of occasional pain on swallowing food. He had had influenza in 1918.

The esophagus examined with thick barium under the fluoroscope and was normal. The heart outline was somewhat enlarged to the right and the right lower lobe was as is seen in Figure 1. The afternoon temperature was 99.2; pulse 90; respiration 28. The red blood cell count was 4,000,000; the white count, 8,200. A tentative diagnosis of lung cancer was made, and bronchoscopic examination advised. A biopsy specimen proved to be carcinomatous. Deep *x*-ray therapy seemed to diminish the size of the mass and to relieve the pain, but the course was progressively downward. He developed pleural pain, bloody pleural fluid and an active pericarditis and died March 21, 1927. Autopsy showed no other primary cancer and no metastasis except in the regional glands and in the pleura.

Case 2.—This patient complained chiefly of stomach trouble and pain in the kidney region and was admitted to the Ancker Hospital on March 13, 1929, with a provisional diagnosis of gastrointestinal malignancy and arteriosclerosis. He was a laborer seventy-five years of age. His chief complaints on admission were weakness, dyspnea, loss of twenty pounds in weight, constipation, pain in the right kidney region and epigastric distress. Four months previous to admission he had had an appendectomy and was well for a month. Three months prior to admission he developed influenza and had coughed and raised considerable sputum since that time. There had been no hemoptysis. Two weeks prior to admission his abdominal pain had become worse and continued to be his chief complaint until his death on May 21, 1929.

The liver was palpable and nodular and a definite area of consolidation could be outlined just to the right of the right heart border, and corresponding to the inner one-half of the right lower lobe. *X*-ray of the gastrointestinal tract was negative and the chest film on March 19, 1929, showed a large fairly localized shadow extending from the right border of the heart into the base of lung, with probably also some atelectasis of the lower lobe. During the stay in the hospital he developed bloody sputum and had several small hemorrhages and later also a bloody pleural fluid which recurred rapidly after aspiration. It was only a few weeks before death that he complained of pain in the right chest. The red blood cell count was 4,000,000;

white, 8,000 until one week before death, when it reached 10,800. A diagnosis of primary lung cancer was made. Autopsy verified the diagnosis and in addition metastases to the liver were found.

*Case 3.**—This case represents one of the so-called "silent type," with no or very few symptoms suggestive of lung pathology. Many of this group are only diagnosed at autopsy. A female, aged 42, a housekeeper, was admitted to Ancker Hospital, October 9, 1928. She left under protest November 28, 1928, with a diagnosis of pulmonary osteo-arthropathy and mitral regurgitation. Her history stated that her hands, feet, wrists, ankles, and knees had been painful and slightly swollen since last April. Also, that since the onset of her illness she had lost thirty pounds in weight and had lately developed a dry unproductive cough. One year ago she had had a severe bronchitis from which she recovered, after which the joints became painful and swollen. After leaving the hospital she was treated outside for infectious arthritis with the removal of her tonsils and teeth. She did not improve, however, and was readmitted in October, 1929, having slowly failed since leaving the hospital the previous November. The joint trouble at this time was still the principal complaint but she still had the dry, unproductive cough and had lost more weight and was quite weak. On October 29, 25 c.c. of thin bloody fluid was aspirated from the left pleural cavity. The red blood cell count was 4,000,000, white 8,400, and Hb 70 per cent. The course was progressively downward; she died December 13, 1929. Autopsy showed primary carcinoma of the left bronchus with involvement of the diaphragm and parietal pleura.



Fig. 12. Case 3. Same periosteal proliferation in the tibia and fibula, showing absence of joint involvement.

*Osteo-arthopathy—The rheumatic complaints of Case 3 were apparently on a pulmonary arthopathy basis. Wells reports references to this condition in thirteen cases out of ninety selected at random and states that there is a definite hyperplasia of the pituitary gland. Brunn actually found metastases in this gland in one case.

The close association of the changes in this condition to those of acromegaly warrants a more careful examination both macrascopically and microscopically of this gland at autopsy in these cases. (Figs. 10, 11, 12.)

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THE CHILDHOOD TYPE OF TUBERCULOSIS

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MUCH has been written, recently, about the relation between the adult and childhood types of tuberculosis, and the outstanding work in this field has been done by Chadwick,[1] McPhedran,[2] Myers,[3] and Opie et al,[4,5] who have published their conceptions of this relationship.

This paper does not represent any new work, but will illustrate further and in a way bear out the observations of the men mentioned above.

All of the cases to be cited and illustrated have been or still are patients at the Nopeming Sanatorium.

The essential differences between the adult and childhood types of tuberculosis as shown by the previously quoted authors are as follows:

The childhood type is the result of a primary infection with the tubercle bacillus and for this reason it is the type of tuberculosis that occurs usually in children and only rarely in adults, while the adult type of tuberculosis is the result of a reinfection and is the kind of tuberculosis usually found in adults and only rarely in children.

The initial or primary infection may be localized in any part of the lung, whereas the reinfection lesions usually are localized in the apices and extend along the pleura. The first clinical manifestation, however, is often below the clavicle.

The associated tracheobronchial lymph nodes are always involved in the childhood type although this may not always be demonstrable, while in the adult type these glands are not involved except occasionally in the terminal stage.

Caseous lesions in the primary infection type usually become calcified or encapsulated in fibrous tissue, whereas this kind of lesion in the reinfection type is followed by excavation or fibrosis, or both.

Infiltrated areas commonly resolve, leaving trivial or no scars except for foci of caseation which calcify in the childhood type while in the adult type infiltrated areas resolve with the production of more or less fibrous tissue.

The primary infection carries with it a good prognosis, while the prognosis of the reinfection type is poor if it occurs in children or adolescents.

Bearing these differences in mind, it is also noteworthy to consider the fact that the tuberculin reaction is 80 per cent positive in children of families where there is an open case of tuberculosis and only 20 per cent positive in children of families where no tuberculosis exists.[4, 5]

This knowledge becomes important when we realize that over 50 per cent of boys and girls in the teen age with the adult type of tuberculosis also have definite evidence of a previously existing childhood type of tuberculosis manifested by calcifications present in the lungs.

We present, as further support of the above mentioned facts and differential criteria between adult and childhood types of tuberculosis, the following cases of primary tuberculosis in children and in one adult.

Case 1.—B. H., a white female, four years of age. The mother has tuberculosis, also a sister, both of whom are in the Sanatorium. This child has always been very well and active, but because of contact with her mother, she has been under close observation. She is entirely free of symptoms, temperature and pulse are normal, and she is very well nourished and even overweight; physical signs are absent. Mantoux test strongly positive with 0.01 mgm. tuberculin. Figure 1 shows a sharp inflammatory reaction in the right upper lobe surrounding a dense outgrowth from the mediastinum, which is in all probability a lymphadenitis.

This case illustrates tuberculosis of the tracheobronchial lymph nodes rather massive in character, and falls into lesion F of McPhedran's[5] classification of pulmonary lesions in childhood and adolescence. The prognosis in this case is serious, because of the danger of caseous pneumonia or miliary tuberculosis developing.

Case 2.—L. A. K., a white female, three and a half years of age, has been at Nopeming Sanatorium eight months. The mother died of tuberculosis. The patient has never had any symptoms of disease. Physical examination is negative, except for a small area of impaired resonance just below the left clavicle. The von Pirquet test is 3 plus. The child is growing rapidly, and is overweight for her age and height. The lesion was accidentally discovered in the course of a routine examination, which was made because of exposure to the mother. *X*-ray of the chest, shown in

Figure 2, reveals a rather diffuse, massive, childhood type of tuberculous infiltration at the level of the left clavicle.

The prognosis in this case is good unless the lesion progresses. Associated, demonstrable, uncalcified nodes, especially if multiple, would indicate a grave prognosis. There is danger that a confluent bronchopneumonia or a miliary tuberculosis may develop.

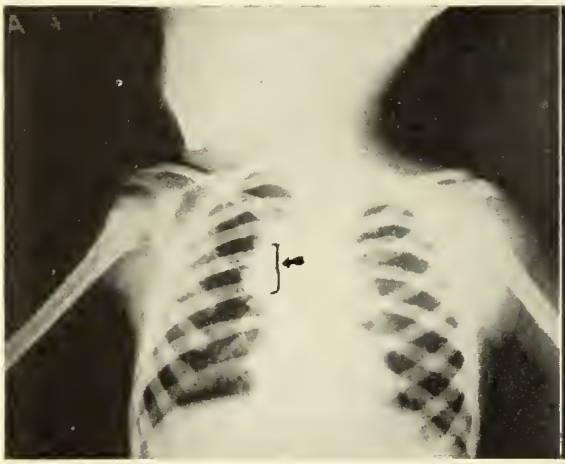


Fig. 1. Hilus enlargement.



Fig. 2. Diffuse childhood type of tuberculous infiltration.

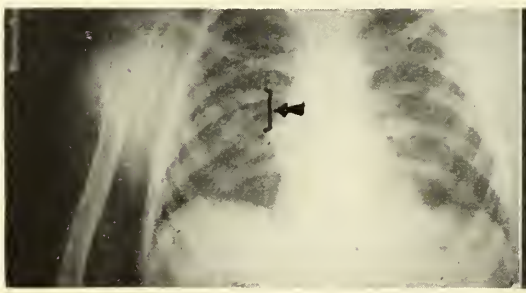


Fig. 3. Diffuse childhood type of tuberculous infiltration.

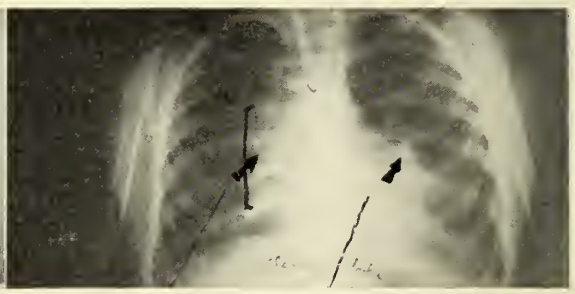


Fig. 4. Calcified node (*left*). Blurred cardiac margins (*right and left*).

Case 3.—J. S., a white male, five and a half years of age, has been at Nopeming three years. The father has tuberculosis and is also at the Sanatorium. Symptoms began in this boy in 1926 following an attack of bronchopneumonia. A persistent cough followed with a moderate loss of weight. Chest examination in 1927 showed impaired resonance on the right side toward the base, suppressed breath sounds, but no râles. The von Pirquet test is strongly positive. At the present time he is gaining weight, has no symptoms, and is growing steadily with no positive physical signs. *X*-ray examination shows a diffuse tuberculous infiltration which is of the same type as shown in Figure 2.

The photograph of this *x*-ray (Figure 3) does not show the lesion as well as the negative.

Case 4.—C. K., a white male, nearly four years old, has been at Nopeming one year. The mother died of tuberculosis. Symptoms began one year before admission with a persistent, productive cough. Expectoration was profuse and consisted of purulent material. There was a history of frequent respiratory infections and failure to gain weight.

Examination of chest shows impaired resonance at both bases, exaggerated breathing and coarse râles. The von Pirquet test is strongly positive. At the present time the child is doing very well, but still coughs slightly and raises small amounts of purulent sputum early in the morning. Weight and temperature are normal. Sputum has always been negative. Guinea pig inoculations were negative.

X-ray of the chest (Figure 4) shows blurring of both right and left cardiac margins due to chronically dilated bronchi characteristic of bronchiectasis. At the level of the third rib, anteriorly, next to the cardiac margin on the left side, is a discrete, circumscribed area of increased density due to a calcified, tuberculous, hilus lymph node.

This is the same type of childhood tuberculous lesion illustrated in Case 1, plus bronchiectasis.

Case 5.—S. K., a white female, 14 months old, has been at the Sanatorium two and a half weeks. The mother has advanced tuberculosis, which was diagnosed before the child was born. After the birth of the child,

the mother was advised by a doctor to nurse her child. When the child was eight months old, the mother became too weak and ill to care for it, and was sent to hospital. The infant did quite well until ten months old, when she became weak, ran a fever, refused to eat, and lost interest in things.

Physical examination showed impaired resonance in the middle portion of the left lung, suppressed breath sounds, but no râles. The von Pirquet test was strongly positive. After being in the hospital six weeks, she developed all the symptoms of meningitis. Her temperature constantly was 100° to 106°, pulse 160. Spinal fluid was under increased pressure with a cell count of 10 per cu. mm. After meningitis symptoms had been present for two weeks, she died. The diagnosis was confirmed by autopsy. Figure 5 shows a tuberculous consolidation of the middle portion of the left lung.

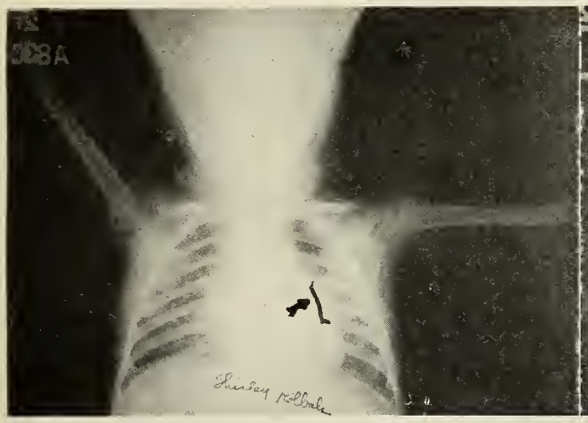


Fig. 5. Tuberculous consolidation—wedge-shaped.

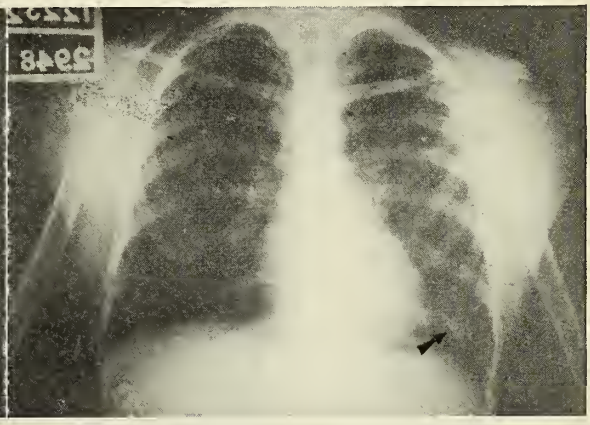


Fig. 6. Focal tuberculous calcified nodule.



Fig. 7. Generalized mottling of miliary tuberculosis.

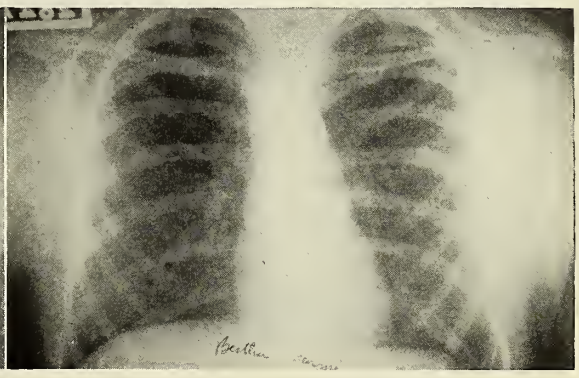


Fig. 8. All mottling has cleared up.

This type of lesion falls into Class C in McPhedran's[5] classification. The prognosis in this type of case is uncertain, usually retrogressive, but in Case 5, tubercle bacilli entered the blood stream and caused tuberculous meningitis.

Case 6.—L. M., a white female, six and a half years of age. The mother died of tuberculosis. Symptoms began in 1929 with a persistent, productive cough, slight fever and pleuritic pains. There was no weight loss. Chest examination showed no change in resonance or breath sounds, but a few coarse râles in the left base. The von Pirquet test was positive. The patient was at Nopeming six months, gained weight and developed normally. Chest examination was negative and there were no symptoms on discharge. Figure 6 shows a calcified nodule in the sixth intercostal space near the left cardiac margin, which makes this case one of Type A of McPhedran's classification.

The prognosis in this type of case is good, except that a caseous non-capsulated focus in an infant is serious. Associated lymph node involvement is recordable if calcified. If caseous, they are recordable only if much enlarged.

Case 7.—B. N., a white female, aged 13, has been at the Sanatorium a year and a half. There was no history of exposure to tuberculosis obtainable. She was well until June, 1928, when she developed a severe, persistent, productive cough, accompanied with fever, anorexia, loss of strength and weight. Fever has never been over 100°. Mantoux 4 plus with .001 mgm. old tuberculin. *X*-ray plates taken July 3, 1928, show a generalized miliary mottling throughout both lungs. A plate taken November 28, 1928, is shown in Figure 7.

Due to the fineness of the mottling and the poor film, the miliary lesions can be seen only with difficulty in the photo, although they are very definite in the *x*-ray film. Figure 8 is another *x*-ray of this patient taken March 11, 1930, which shows no parenchymal pathology and the only abnormality present is possibly a widened hilus area.

striking decrease in the inflammatory reaction in the left hilus area. The circumscribed area of increased density is seen at the level of the clavicle. The last plate, taken February 18, 1930, and shown in Figure 11, shows a normal hilus area with a small calcified opacity just behind the clavicle. The inflammatory shadow in the hilus area was undoubtedly made up of several

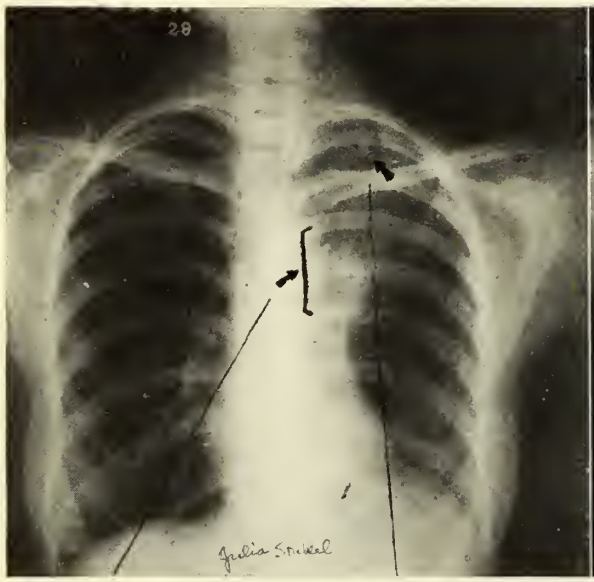


Fig. 9. Calcified lesion (left apex). Inflammatory reaction in left hilus area.

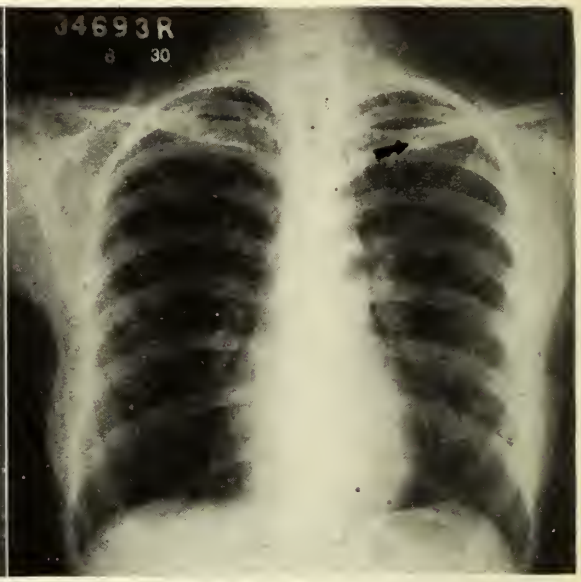


Fig. 10. Calcified lesion.

Recovery in this type of case is extremely rare. In this respect Case 7 is unusual because the patient has at the present time no symptoms and her general condition is good. The intracutaneous test is markedly positive. What future tuberculous trouble this patient will have, would be of great interest to know.

Case 8.—J. S., a white young woman, twenty-four years of age, has been at Nopeming three months There has been no history of exposure to tuberculosis. Symptoms began in September, 1929, with cough, weakness, and loss of weight and strength. Chest examination on November 15, 1929, showed a normal right lung. On the left side there was impaired resonance extending to second rib and the fourth dorsal spine with bronchovesicular breathing but no râles. The sputum was positive for tubercle bacilli. The patient is a strictly bed patient and is doing very well, gaining in weight and symptom-free. The sputum is still positive. The interest in this case lies in the fact that it belongs to the adult type of tuberculosis, but has the usual location of the childhood type. It is also interesting to note that the lesion is clearing up rapidly. Figure 9 shows an inflammatory reaction in the left hilus area with dense lines extending into the apex to a circumscribed area of increased density. This plate was taken November 15, 1929. Figure 10 is another *x*-ray picture taken seven weeks later, which shows a

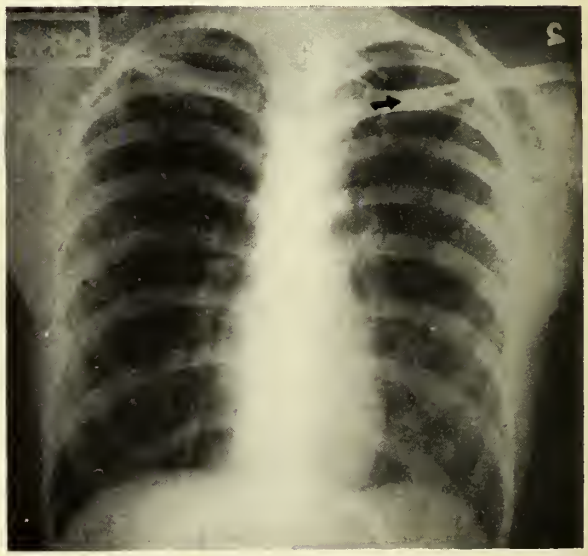


Fig. 11. Calcified lesion.

enlarged tracheo-bronchial lymph nodes together with an inflammatory exudate in the adjacent parenchyma.

This is a case of reinfection because a ghon tubercle is seen in the apex which is the primary lesion. This case illustrates what can be done towards the healing of a reinfection type of tuberculosis if diagnosed and treated early.

The prognosis in such cases is dangerous if the lesion is multiple and occurs in a child. In this case the prognosis is excellent.

In conclusion, it may be of value to state the basis upon which the diagnosis is made: History, symptoms, physical signs, Mantoux test, *x*-ray evidence, and exclusion of other conditions, which may produce similar symptoms.

This paper is offered as illustrative and confirmatory evidence of the work of the authors previously mentioned.

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Years ago, Gustave Le Bon wrote a small classic called "The Crowd," a study of the popular mind, in which he held that a crowd cannot be compared to the individuals that make it possible; that the mean average is probably of little value, as the new character of a crowd takes on new features and the new average is below that of the mean. One learns from Le Bon that a wide chasm may separate a great surgeon from an orderly and yet, as to character, the more lowly one may be the better of the two; that men seem to take to the primitive in the mass; and that crowds may be composed of units spread out over a wide territory held together by a common emotion. All this helps in trying to understand medical assemblages. Doctors in their home environment may be individually men of great judgment and keen to see the dangers of the future. When brought together in the mass, however, they seem to take on rather childlike qualities, as may be seen by their restlessness, tendencies to run in and out, irritation over some mechanical error, and above all their opposition to an address pointing out to them the weaknesses in their nonprofessional outlook. Under the spell of a celebrated speaker or a well known personage, I can think of no audience more quickly led than that of a group of medical men. This was illustrated the other day at Detroit when the powers of the Interstate Post-Graduate Assembly conferred on Henry Ford the honorary title of Doctor before an audience of nearly 5,000 physicians. The crowd went wild and clapped its hands and shouted in childish enthusiasm. Mr. Ford stood smiling amidst a number of celebrated medical men while Dr. Deaver, his picturesque personality all aglow, delivered the bestowal address. The industrialist said not a word, but bowed and retired from the scene, as a mighty roar of approval followed. This idea is covered in Gustave Le Bon's book. Had any member, prominent or obscure, of that august gathering arisen and told this shouting crowd that they were about to award a great honor to one who had lately criticized their whole profession rather harshly in a series of syndicated articles, written on decidedly slender knowledge, and that in Detroit he had built a hospital to controvert directly the medical profession's idea of how a hospital should be run and that in the medical fraternity in his city there was more than one doctor who felt decidedly hostile to his attitude—that member would have been summarily dealt with.

Mr. Ford is a great inventor who made a good car that has carried many a doctor efficiently to his destination. I doubt if Mr. Ford ever constructed his car as a benevolent gesture. But I should like to ask if Behring would not have been a millionaire if he had patented diphtheria serum? Would not Roentgen have been more of a Croesus than Ford if he had received $20 on all *x*-ray outfits and a royalty on the plates? Where would the man be who invented the vaginal speculum if he had patented it? What about Banting and a cent on every unit of insulin? Any one of these men could be where Ford is if he had said he chose to run that way. Always we overlook our own great discoverers.—Hall, Harry M.: Descartes was right. A. M. Assoc. Bull., 24:233.

OCULAR MANIFESTATIONS OF HYSTERIA IN CHILDREN*

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A TEN year old boy whose sister had recently returned from a school for the blind suddenly lost the sight in one eye. When examined a fortnight later the vision of the right was normal while with the left eye he counted fingers only at a distance of two feet. A girl of twelve was shaken up in an automobile accident in which her father was killed. A month later she appeared complaining of poor sight. The vision of each eye was less than 20/200. In both of these patients the objective findings were entirely negative; the functional tests suggested psychic disturbance, and complete recovery eventually occurred in both children. Similar instances are not wanting in biblical literature; in our daily press similar recoveries are still occasionally chronicled under the miraculous.

Now differing not in kind, but in degree only, are the numerous complaints emanating from children, seven to fourteen years of age, a period to which this discussion is largely limited, of blurring and misty sight with the vision by the test chart ranging from 20/30 to 20/70.

Brandenwell Carter, after an extended survey, wrote, "The fact with which I have been most impressed is the existence in London of the very large number of children with subnormal vision, for which their errors of refraction were insufficient to account." In this connection Kerr[1] refers to an examination made by him of 330 healthy boys, in which group seven were found with vision of only 20/50 or thereabout, and with nothing to explain the deficiency, but in all of whom full recovery occurred within a few months without treatment. Wilson[2] located an epidemic of nine or ten such cases which he ascribed to under-feeding, poor housing and post-war depression. Katz[3] says that 4 per cent of Russian children exhibit at one time or another these visual peculiarities. In health and mental balance the children of Minnesota probably equal any in the world, yet from a recent survey of fifteen thousand the writer ventures the opinion that this particular manifestation of the ancient neurosis is nearly as common with us as Katz found it to be in Russia.

In reviewing my records of 250 consecutive refraction cases in children, completed under atropin, hysteria, or more elegantly expressed psychic amblyopia, was found to be the major element of the disturbance in ten. In this group there were nine girls and one boy. All appeared to be well nourished; four complained of headache, one of lacrimation, and two of photophobia. All of them could read fine print (J.2 or 3), but all of them balked at the smaller letters on the test chart. In none of this group were the refractive errors conspicuous, and the correction of such small errors as did exist failed to produce normal vision. The mental attitude was that of indifference and unconcern. Two of the children were sotto-voiced; one girl was said to talk continually in her sleep, and two exhibited that definite evidence of hysteria—monocular diplopia.

This slight degree of amblyopia in which the complaint is blurring of distant objects, with the visual tests showing 20/30 to 20/50, is, as a manifestation of hysteria, more common in children than in adults; and the other ocular stigmata also, I think, predominate in children. Those transient attacks of blurring which are complained of while reading, supposed failures of accommodation, are put down as hysteric by many observers; and into this same diagnostic dustpan Dr. Casey Wood[4] sweeps children's complains of photophobia, lacrimation, and the winking habit. Perpetual frowning and scowling may be mild forms of hysteric contractures. The cramp of the ciliary muscle which produces a false myopia probably comes in this same category. On the other hand, anesthesia of the conjunctiva and cornea, and the severe blepharospasm, mentioned by Burch[5] as occurring in adults, are symptoms not as often seen in the border-line type of hysteria of late childhood. At this age, however, comes into prominence the arch-symptom, monocular diplopia or polyopia—an object doubled, tripled or even quadrupled with one eye closed; and excepting a few pathological rarities, this phenomenon, when it does

*Read before the St. Louis County Medical Society, Duluth, May 8, 1930.

occur, may be said to be pathognomonic of the neurosis. A girl of ten complained of blurring and the doubling of objects. With one eye closed she reported a yellow pencil as "two." A red pencil was now substituted and the diplopia disappeared, but back again to the yellow one, and the pencil was seen as two. These double images of hysteria play curious tricks, but usually they can be differentiated from the diplopias which result from true paralysis. When this interesting symptom is absent in children, the diagnosis of hysteria is largely a matter of assumption, based on the negative objective findings, combined with the type of the complaint and the mental attitude of the complainer. At least, this is true until one reaches the visual fields, and here the diagnosis may usually be stabilized.

For the purpose of mapping the field of vision, and especially for studying changes in the periphery, the perimeter remains the apparatus of choice. It will be recalled that in the four principal meridians the field extends about 55 degrees upward, 70 downward, 65 to the nasal, and 90 degrees or slightly more in the temporal direction. In hysteria, more or less contraction is found in the great majority of cases. A narrowing of even 5 or 10 degrees in the upward, downward and nasal direction, and 15 degrees in the temporal line should give rise to suspicion. If the contraction is a little more than this, and the eye-ground clear, brain disease reasonably excluded, and alcohol, nicotine, quinine and such poisons not in question, then hysteria is very likely at work. When the test object is reported at an equal distance around the fixation point, and can be seen only within the 40 or 50 degree circle, we have the classic, concentric contraction. Parker[6] found this celebrated text-book symptom in nine out of fifty subjects whose hysterical manifestations varied from aphasia to vomiting; while thirty-two of his fifty cases showed slight, although definite, contraction which was not, however, of the concentric type.

A number of years ago, Bjerrum, a Dutch ophthalmologist, discarding the perimeter painted his consulting room door black, against which surface he studied the fields of his patients. Since that time the so-called tangent screen or campimeter has come more and more into general use. For particularly accurate work a black screen 1.5 or 2 meters square, with degree circles marked on the surface, is to be preferred; but for preliminary and tentative studies a well cleaned blackboard, evenly and thoroughly illuminated, serves as a most convenient substitute.

The height of the average blackboard requires a working distance of 0.5 meter. To assist in holding the attention some small object such as a gold star or cross is placed opposite the one exposed eye, and around this fixation point may be drawn faintly dotted circles with radii of 6, 14, 25, 40 and 62.5 cm., which correspond respectively to 10, 20, 30, 40 and 50 degrees on the perimeter. Beyond the last mentioned distance, however, the field on the screen cannot be expressed in degrees without geometric computation.[8] In the absence of these degree circles on the blackboard it will be noted that a 2 cm. white test object, held on the tip of a black pointer, will be detected in the four principal meridians, about 60 cm. upward, 70 to the nasal side, 80 downward and 110 cm., or slightly more, to the temporal side. If the object is not reported within 10 cm. of these distances, a slight contraction is present which may call for closer study or mapping on the perimeter. If the field is contracted to 50 degrees in all directions, as it is in many hysteric cases, then the blackboard is as satisfactory for the purpose of studying the case as any tangent screen. Accuracy requires fixation of the head, one eye comfortably closed, even distribution of light (5 to 7 foot-candles), fresh test objects; and a slight allowance made for myopia, long lashes, deeply set eyes, etc. In addition to these contractions of the visual field which occur in hysteria, there are other phenomena which the simple blackboard will disclose:

1. Normally the field is somewhat widened with the enlargement of the test object, and more especially if the subject is moved further back. In hysteria this does not occur to the same extent, if at all, and the field is then described as "tubular"—a condition necessarily of functional origin.

2. With the normal subject there is an area of uncertainty as the test object is moved back and forth over the edge of the field. In hysteria the patient is likely to be more prompt and positive in reporting the appearance and disappearance of the object, which may be seen as coming in "bit by bit," or "just half in sight," if a large test object, such as a piece of writing

paper, is used:[7] thus, the field is sharply demarcated.

3. The "predilection for red," stressed as a characteristic of hysteria, shows itself frequently as a fully normal or slightly exaggerated field for that color, while the form or white field is considerably contracted. In this connection, girls, who are rarely color blind, may be found confusing various shades which under normal circumstances they would readily distinguish.

4. Foerster's displacement phenomenon depends on the fact that the appearance of an object within the field exerts a greater stimulation than its disappearance. If an object is moved from the extreme temporal side it may be perceived at 90 degrees, when moved across the center it may disappear at 35 degrees on the nasal side while it should be seen as far as 60 degrees. This is an occasional happening in hysteria.

5. Color field interlacing and reversals are too complicated and time-consuming for young subjects in whom this game of hysteria hunting may well be limited to five minutes at a sitting.

It is not only those who show eye symptoms who exhibit the fields of hysteria; these peculiarities are quite as likely to be present when the complaint is referred to some point as far from the orbit as the tip of the spine or the "pit of the stomach." As an experimental control I tested fifty uncomplaining and healthy appearing children of average intelligence, from eight to twelve years of age. Forty-four showed full, normal fields; four were slightly contracted—faulty attention and appreciation; one boy, generally inaccurate; one girl, probably unsuspected hysteria. For the purpose of comparison I then tested fifty of the same age period, all of whom had been passed as having no obvious physical defects, but who were given to complaining of headache, side-ache, fugitive pains in various localities, vertigo and so on. In this group of complainers, twenty-two showed more or less field contraction: ten moderate narrowing; twelve concentric contraction, and in other respects the fields were definitely of the hysteric type. Also, in the group of ten young amblyopes previously referred to, eight showed definitely contracted fields. The boy mentioned in the introduction of this paper had a narrow and tubular field on the right, on which side he did not allege blindness, and the girl of the automobile accident had fields confined to the 20 degree circle.

Pierre Janet[9] defined hysteria as "a form of mental depression characterized by retraction of the field of consciousness, and a tendency to dissociation, etc." This limitation of consciousness is comparable to the contraction of the visual field, which is, indeed, part and parcel of the general inhibitory process. The hysterical subject according to this view is incapable of taking into the field of consciousness all of the impressions which the normal individual is aware of; and it is this failure which can be so easily demonstrated, and to some extent measured, on the ordinary blackboard. Charcot[10] first stressed the frequency of cutaneous anesthesia in hysteria, although the neurologists now say that this is not as frequent an occurrence as the French master originally insisted. These visual field contractions, with their concentric form and abrupt edges, are again comparable to the curious anesthetic areas of geometric pattern and sharp outline found on the surface of the body. In medieval days, and even on into the eighteenth century, adepts in the art of locating these spots with lost sensation were professionally employed in testing the epidermis and mucous membranes of those suspected of being satanically possessed. Could the "tester" outline the claw of the Devil, or any anesthetic area resembling it, it was all up with the unfortunate suspect. Well was it for the witches that the tangent screen was not in use in those days.

The matter under discussion has been limited to preadolescents because they have been available for group study; partly, too, since they are less subject to the border-line neuroses, and partly since behind their complaints there is less likelihood of organic disturbance. Moreover, the mind of a child, from seven to fourteen, corresponds to the period of psychological development of ancient and medieval people, among whom, from all accounts, hysteria was highly prevalent. Also does this affection turn more to the eyes than formerly, with the increasing number of ophthalmologists, the glittering advertisements of optometrists, and the increase of schoolbooks, school nurses and test charts. Hysteria, too, changes its fashions: there are now fewer witches and fewer bewitched; the phantom

tumor is not as frequent as it was thirty years ago; the nail of Sydenham[15] has been replaced by tenderness in McBurney's point; globus hystericus is somewhat replaced by those undetectable foreign bodies in the throat, the search for which so wearies the laryngologist. From fourteen to nineteen may have been the preëminent half decade for hysteric exhibitions in the reign of Queen Victoria when girls of that age were more tightly dressed and more socially suppressed than at present, and had less opportunity to let loose their emotions. Even somnambulism is less heard of since young ladies have taken to pajamas. The age of hysteric preference may have moved down from sophisticated sixteen to the more simple minded year of eleven. Today, also, not only are the eyes more frequently involved than formerly, but the Devil's claw has recently reached into the paranasal sinuses. A few days ago a child appeared saying she had "sinus trouble"; no careful study of the nose had been made, and no *x*-ray pictures taken, but she did exhibit a sharply contracted visual field.

CASE REPORTS

Case 1.—Hilma K., aged 9, Finnish. Complaint: Indistinctness of the writing on the blackboard, and the fading away of the features of her teacher (the child had been recently separated from her parents and farmed out). Appearance: Healthy, well nourished. Demeanor: Passive. Vision each eye 20/40. Reads fine print (J.2) without difficulty. The fields are concentrically contracted, of tubular type, and the test object is reported with alacrity as it passes over the edge—and this in contrast to the rather slow responses which are given to other tests. One month later refraction under atropin showed hyperopia 1 diopter, and a trace of astigmatism. Vision not improved with any correction.

Case 2.—Viola B., eight and a half years old, Italian. Complaint: Blurring of objects in the school room; lacrimation, photophobia. Vision 20/40. Fields limited to 40 degrees in all meridians. Refraction under atropin: Hyperopia, as in Case 1, with a half diopter of astigmatism. No improvement of vision with any correction.

The glasses with which these children were provided were soon discarded when some weeks later the vision became normal and their eye troubles had been forgotten.

Hyperopia of one diopter and a small degree of astigmatism occurs in 50 to 60 per cent of the children of this age.[12] Whatever change takes place in the refractive error is slow and is not materially influenced by the wearing of glasses. A group of sixty children were observed who had had such weak plus corrections ordered. Forty-eight of these children were persistently forgetting to wear their glasses. "Eye strain" in childhood is a bogey to be regarded with some suspicion. "Asthenopia, meaning weakness of vision, is a functional condition more common in early adult life than in children." (Kerr.) "The retina does not get tired and refuse to function; variations in response are due to variations in central rather than retinal function, and the terms retinal fatigue and retinal asthenopia have probably a much more restricted significance than is usually attributed to them." (Traquair.)

Case 3.—Louise F., aged 12, had had a bad cold in February. In the month of April, after a quiet interval of six weeks, she begins to cough daily about 2:00 p. m. and keeps it up until school is out. The cough is non-productive; pulse and temperature normal; chest, nose and throat negative; but the visual fields are typical of hysteria.

Case 4.—Mary D., aged 11. The complaint is that of recurrent pain in the right side. Physical examination has given negative results; fatigue, diet and posture have been considered. The only positive finding is a visual field limited to 40 degrees, and tubular in type.

Case 5.—Ellen S., aged 11. Healthy in appearance, slightly underweight, she has few complaints. The pulse rate while standing was found to be 120, and after 10 minutes in the recumbent position 106. Temperature normal; recent history and physical examination negative. No coffee; no evidence of mental excitement. The visual fields were similar to those mentioned above. The pulse rate five days later was 104 while resting, and the fields were still contracted: hysteric tachycardia (?).

Case 6.—Alice H., aged 13. Slightly anemic; growing rapidly; mild fatigue symptoms. Pulse 105 while resting; distinct tremor of the extended fingers and a fibrillary tremor of the tongue. There is a suggestion of an exophthalmos and an enlarged thyroid of the type and size found in 20 per cent of the girls in this locality. The central vision is normal, but the fields contracted, tubular, and very sharply defined. This girl reported to be very nervous, appears to be taciturn and unconcerned. Six months later the tremor had quieted down, the pulse slowed, and the visual fields were back to normal.

Case 7.—Ellen F., aged 14. Referred for examination of the eyes because of difficulty with reading and "terrible headaches." There was no manifest refractive error; muscle balance, accommodation and vision were apparently normal. The headaches, the location and periodicity of which she was very vague about, dated from an appendicitis operation fourteen months before. She also stated that her doctor had given her pills which had caused the trouble with her eyes. The fields were typical of hysteria.

This same story of an appendicitis operation

followed by persistent headaches I have heard from two other girls who showed hysteric fields, and in whom there was no pronounced refractive error, and little else to account for the complaint.

Case 8.—Margaret S., aged 18. This girl had been admitted to the hospital with a diagnosis of appendicitis made by one physician, and of pelvic abscess by another. I was asked casually by the surgeon-in-charge to see this patient who alleged great tenderness in the lower right abdomen and exhibited rigidity of the abdominal wall. The temperature and pulse were normal. A day or two later on with an improvised screen, the visual fields were found moderately contracted—about 20 degrees. The complaint of abdominal tenderness, however, being persisted in, an exploratory operation was performed: appendix normal; no abscess found; recovery rapid.

Case 9.—John H., aged 13. Long legged and slow brained; in an opportunity class with children several years his junior. The boy was eager to get away from school and work on a freight boat. There had been some complaint of poor sight, but the vision reached 20/20 after coaxing; the fields, however, were those of hysteria, and that he was reporting with a fair degree of accuracy was evidenced by the rapidity with which he located and outlined the blind spot; a proof of concentration and observation which is entitled to a position among the mental tests, but not yet included in the text-books.

Case 10.—E. H. A highly intelligent boy of 20; an only child, constantly attended by one or both parents. He has stammered, moderately and intermittently, since early boyhood, and has been much examined with negative results. Recently a pronounced tremor of the fingers has developed, and the handwriting begins to show irregularity; there is a scanning type of speech. The visual field shows a slight shortage in the upper nasal quadrants, and extends only to 75, in place of the normal 90 degrees, in the temporal line. This supports the suggestion of disseminated sclerosis, but fortunately may belong to the more common affection.

The pathology of hysterical amblyopia has its seat neither in the eye or the visual pathway to the occipital lobes nor in those receiving stations, but, it is suggested, in the fibres which run from thence to the higher intellectual centers where "the synapses at one or more of the cell stations in the path to the cerebral cortex must become unswitched, probably as the result of the retraction of the dendrons";[11] thus, the going wrong of a localized process which is somewhat akin to the widespread cerebral working which results in natural sleep. The result is a failure in the function of response to that which is properly registered in the brain; a fault, if you will, in the starter! On another occasion in the same type of brain certain inhibitory fibers fail—the brakes won't work—sobbing, laughing, hiccoughing, naturally excited, unnaturally persist, and we are confronted not with blindness, deafness and such, but with "hysterics."

As a diagnosis "hysteria" is unpopular, both from the standpoint of patient and physician; to the one the word implies a weak mind and a suspicion of prevarication; to the other it is an indefinite affection, and one as yet not clearly defined. For the oculist the word hysteropia, an invention of Dr. Casey Wood, is a convenient refuge. Hysteria, however, must be admitted to be a clinical entity, although one which, unless we possess the superknowledge of the psychoneurologists, we are prone to confuse with the other neuroses and psychoses which Freud and others have so striven to teach us to separate and distinguish. It is neither imagination gone rioting nor malingering. It is not merely the result of suggestion, although those afflicted with hysteria are most easily led by that process. The idea of a defense reaction continually suggests itself; children are most frequently affected in school-time; adults thus react to "an intolerable situation." Our most remote ancestors probably utilized the trick (now referred to as a neurosis) to save themselves from assaults of their enemies, as do molested spiders and the proverbial opossum. All of this relates to but does not define hysteria, which Mobius, Janet, Babinski, Freud[14] and forty others have attempted with more or less disagreement. Plato[13] himself planted the misnomer in a poetical definition; and this idea about the uterus lasted from 400 B. C. until about 1750 A. D. when the disease was discovered in the male of the species by one Raulin,[9] a Frenchman, who may have gotten his idea of masculine participation from Sydenham[15] who was, indeed, antedated in this by Shakespeare.[16] All medical Europe was racked for a while over this heresy to a long cherished belief, which may come again into its own when we find that hysteria is due to the curdling of the ovarian hormone, or the accidental precipitation of its analogue in the male.

The question here is not just what hysteria is, nor by what method the affliction is to be relieved, for those are the problems of psychoneurology; but how shall it be told, and to what extent does it mix in and complicate the already somewhat discredited science of symptomatology? It is common in those of childish mind from eight to forty-eight and on; its minor

exhibitions are especially frequent in preadolescence. If in one of these young subjects one eye alone sees double, or the visual field is concentrically, or otherwise contracted, it is a four to one venture that the patient in her (or his) complaint is mimicking, magnifying or prevaricating, and the last—without any reflection on the moral aspect—to such an extent that the substitution of the name prevaricosis multiforme might not be out of place.

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Oh, how this mother swells up toward my head, *Hysterica passio,* down, thou climbing sorrow * * *
Act II, Scene IV. 1605 A. D.

VALVULAR HEART DISEASE IN YOUNG ADULTS*

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THE observations noted in this paper are from 67 cases, chiefly University students, who were given entrance and subsequent physical examinations which revealed valvular heart defects. These examinations were done routinely or on account of the presence of cardiac murmurs, tachycardia, palpitation or anxiety regarding suspected heart trouble. The cases then were selected, from a large group ranging as to age from 15 to 35 years with an average of 20 years, and as to sex, 47 males and 20 females, from a student body in which males predominate approximately 2 to 1. It is a selected group also in that they were individuals without cardiac decompensation; as a rule they had suffered little or no inconvenience from their condition and they may, therefore, be considered in the heyday of life as far as cardiovascular efficiency is concerned. Only 17, or about one-fourth of the group, had noted dyspnea.

An attempt has been made to use critical judgment in the diagnosis of the type of lesion. The clinical picture presented by the group with aortic insufficiency has been as clear as any known. A diastolic murmur beginning early and heard best at the left sternal border, associated with water-hammer pulse, has been considered pathognomonic of aortic insufficiency. Often capillary pulse and Duroziez sign were demonstrable. Similar peripheral vascular signs with increased pulse pressure present in hyperactive hearts, notably in hyperthyroidism, were of course not considered significant. On the other hand, hardly any single pathognomonic sign of mitral involvement in the absence of demonstrable pulmonary congestion was known, although, in mitral stenosis, diastolic murmur at or near the apex has been emphasized and, with bulging in the area of the pulmonary conus, has been considered pathognomonic. A check of clinical diagnosis with necropsy findings has shown, according to Cabot (1), that mitral stenosis of all valvular lesions has been most frequently overlooked; that in a series there were 107 solitary lesions of the mitral valve compared to 28 of the aortic, and that 25 of the 28 were in men. Dr. E. T. Bell[2] states that in a series of about 460 necropsies which revealed valvular defects of rheumatic origin over 50 per cent had involvement of the aortic valve, usually combined, and that solitary lesions of the mitral valve were about three times as common as defects of the aortic valve. Such usual pathological findings would indicate that, in the group reported clinically recognized as having solitary aortic lesions, the mitral involvement may have been occasionally unrecognized.

Paul D. White,[3] in Cecil's textbook, classifies the types of valvular lesions as follows: 100 mitral, 50 aortic, 25 tricuspid, and pulmonic one or less. Willius[4] found, in a series of 170 cases, 78 per cent of mitral, 13 per cent of aortic, and 15 per cent combined. In a recent report, B. A. Schwartz[5] in 55 cases of valvular disease, 40 under 11 years of age, found 51 of mitral involvement, 3 aortic, and one combined. The impression gained from this last observation is not supported in the series here reported, where there is a relatively higher percentage of aortic involvement. It is thought that an inadequate impression of the incidence of involvement of the aortic valve in rheumatic infection has prevailed, fostered in part by certain texts which have not recorded series of cases.

In the 67 cases reported, 22, or approximately one-third, were classified as mitral stenosis and insufficiency, 18 as mitral insufficiency, 20 as aortic insufficiency, 2 aortic stenosis, 4 aortic insufficiency combined with mitral stenosis and insufficiency, 1 aortic insufficiency and stenosis combined with mitral insufficiency; 27 cases, or 40 per cent, had aortic involvement alone or combined. In aortic cases, solitary and combined, males predominated 22 to 5, while in mitral they predominated only 25 to 15.

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Outline of the heart upon six-foot plates and by orthodiagram more recently was obtained in 33 cases and bulging in the region of the pulmonary conus aided in establishing the diagnoses in 10 of 17 mitral cases, and increase in the left ventricle in 7 of 13 aortic cases. The others did not show change considered to be above possible normal limits. In the group studied, inability to demonstrate in certain cases change of cardiac outline by *x*-ray calls attention, first, to the fact that with perfect compensation there may be very minimal change actually present; and, second, to detect minimal changes the *x*-ray interpretation of cardiac outline should be made in view of the individual's height and weight and that more frequent examination of the retrocardiac space by esophagram be made.

The detection of cases largely silent as to usual cardiac symptoms is illustrated by K. R., aged 20, engaged in active athletics, wrestling, who appeared for examination on account of moderate sleeplessness. Physical examination revealed aortic insufficiency without preceding infections except occasional sore throats and without recognized change in cardiac outline on the six-foot plate. He was advised to guard against cardiac overload and to have tonsil tags removed. Four years later a fatal illness supervened and necropsy showed subacute bacterial endocarditis and the old fused aortic valve defect. Another case in the series with aortic defect is known to have succumbed to subacute bacterial endocarditis.

Seventy-one per cent gave a history of rheumatic fever or chorea 1 to 15 years previous to observation, with an average of 7.4 years, which would make the average initial attack at 12.5 years of age. The incidence was essentially identical in individuals with mitral involvement and in those with aortic alone or combined. Approximately one-third, or 31 per cent, of those with rheumatic fever had recurrent attacks. Lues was not found in any case. Electrocardiographic study was not available in a majority of instances.

As a control, a record was made from 100 histories in normal males of similar age regarding the incidence of rheumatic fever and tonsillar infection and removal. Two gave a history of rheumatic fever; 27 gave a history of tonsilitis; 36 had normal appearing tonsils; 42 had had tonsillectomy; and 22 had infected appearing tonsils.

Approximately one-half, or 36, gave a history of frequent sore throats, tonsillitis or quinsy. Nine out of 19 cases without rheumatic fever gave a history of attacks of tonsillitis and only 2 without a history of rheumatic fever or tonsillitis had scarlet fever alone. There were 17 instances of both scarlet fever and rheumatic fever or tonsillitis. Scarlet fever alone did not appear to be an important precursor.

While there was the usual expected frequency of history of rheumatic fever, an appreciable number (15 per cent) have remembered no significant throat infection or joint or muscle pains in childhood. Thirty-five, or slightly over half of the group, had had tonsils removed with a clean result; 15 had tags remaining, and 14 had not had tonsillectomy. Several had had tonsillectomy two or more times. The possible malevolence of tonsil tags in this relationship is illustrated by G. F., male, age 21, college athlete, who gave a history of tonsillectomy in childhood. In December, 1929, he developed tonsillitis, followed two weeks later by rheumatic fever with subsequent development of signs of mitral insufficiency which were not present at the time of previous examination. Delayed complete tonsillectomy was done and the door was locked after the horse was stolen. Not infrequently tonsillitis in small tags has been noted with marked systemic reaction.

Although it is realized, as stated by Swift,[6] that available statistics do not show any great advantage in tonsillectomy from either a prophylactic or curative standpoint with regard to rheumatic fever, figures at present are too meager for final judgment. Farnum,[7] in a report concerning the effect of tonsillectomy upon existing cardiac disease in 526 adults, chiefly with valvular defects, concludes that if tonsillectomy is to be used in the future as a definite therapeutic measure its best results will be obtained before the incidence of heart infection or very early in its course; and that the removal of tonsils certainly will not guarantee a halt in the progress of existing cardiac disease, because the cause of such infection may still be present in the throat or elsewhere in the body.

Gordon[8] expresses a common attitude that the tonsils may be considered guilty until proved in-

nocent; that rheumatic fever may develop after satisfactory enucleation, but that such attacks are milder and cardiac damage less pronounced. A continued minimal fever after acute tonsillitis without rheumatic fever, as occasionally seen, cannot help but impress the clinician with its significance as a cause of carditis when associated with signs of valvulitis. Illustrative is M. B., female, aged 21, who had acute follicular tonsillitis with marked systemic reaction and with minimal fever and tachycardia continuing for about eight weeks without tuberculosis or other demonstrable infection. Carditis may have occurred and, although positive proof was lacking, the development of systolic murmur and tachycardia was suggestive. In this series no history of the first attack of rheumatic fever occurring after clean tonsillectomy was obtained. Even if allergic phenomena, as emphasized by Swift, are of importance, nodes of primary infection will always challenge interest.

Again, thinking in terms of sore throat and rheumatic infection, even in those who have had all their tonsillar tissue removed there has occurred not rarely a so-called follicular pharyngitis in which patchy exudate, edema and injection involve the lymphoid tissue of the pharynx instead of the lymphoid tissue known as the tonsil, with as severe systemic reaction as in tonsillitis. In the student group, the frequency is striking with which this type of pharyngitis has occurred with marked systemic reaction in individuals either with or without tonsils. The local and general reactions are similar to tonsillitis and there is no good reason to postulate any other type of bacteria as causative. Granted that the lymphoid tissue of the pharynx does not present the opportunity for chronic infection and formation of pus pockets as do the tonsils, situated in their restricting fossa, it is nevertheless the frequent seat of an apparently primary acute infection which may be significant as regards rheumatic fever and carditis, and persisting hypertrophy suggests chronic infection. Small[9] believes that the organism of rheumatic fever prefers the superficial sites in the pharynx and describes, in that disease, a reddening of the anterior pharyngeal pillars extending upward toward the uvula, without ulceration or exudate, coinciding possibly with the rheumatic throat of the older clinicians. Nasal and dental infections are, of course, factors which participate in the infection and hypertrophy of the lymphoid tissue of the throat and must be considered in treatment. In addition, other less obvious portals such as the gastrointestinal tract have been suggested. The not infrequent occurrence of subacute bacterial endocarditis, possibly due to the same organism as rheumatic fever, should emphasize the importance of reducing predisposing tonsillar, oral or nasal infection. If it is avoided, the other horn of the dilemma, decompensation, may possibly be indefinitely delayed, granted that physical overload can be consistently reduced or that the lesion is minimal. The management of the group as above illustrated, resolved itself, in the main, into reduction of physical overload, the avoidance of dyspnea and also invalidism, and the promotion of physical fitness as contributing to increased resistance to infections.

While recognizing that the problem of rheumatic fever has its roots deep in fields that include epidemiology, immunology, and bacteriology, from the clinical standpoint insufficient emphasis has been placed upon the importance of complete tonsillectomy, also upon the importance of pharyngitis and the methods of ridding the body of such infection. Williams[10] and others have advocated the use of radium in the treatment not only of pharyngitis but also of tonsillitis, acute or chronic.

In an attempt to determine whether and how often acute follicular tonsillitis is accompanied by bacteremia, Dr. B. J. Clawson has consented to examine the blood cultures taken during the active state of acute follicular tonsillitis. So far no positive cultures have been obtained.

SUMMARY

1. The good functional capacity of most individuals in the series was noted.

2. The relatively high incidence of aortic insufficiency was noted in a series of cases. This corresponds well with actual pathological findings referred to.

3. Clean tonsillectomy had been done in only about one-half of the cases.

4. The frequency of hypertrophic and follicular pharyngitis is discussed in view of pos-

sible significance in relation to rheumatic fever, the methods of treatment, and prevention.

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THERAPY WITH OVARIAN PREPARATIONS

The Council on Pharmacy and Chemistry sponsors the following statement on therapy with ovarian preparations in the current (1930) edition of New and Non-official Remedies: "Rational as ovarian therapy may theoretically appear to be in some conditions, the actual results are rarely striking, and often nil to the careful observer. It is altogether probable that the activity which may be presented by the fresh gland is not contained in a finished desiccated product, or else, when given by mouth, it is destroyed by the digestive juices; extensive clinical experience has failed to establish the value of desiccated preparations administered orally. There is considerable evidence that the aqueous extracts prepared for hypodermic use are inert . . . much work has been done toward the elaboration of a potent, standardized preparation of the ovary, and as a result of these investigations such potent standardized preparations for use by subcutaneous injection have become available. These preparations have been shown to induce estrus in mature animals and to induce sexual maturity in immature animals. Somewhat limited clinical evidence indicates their probable value in ovarian hypofunction." The Council has omitted all desiccated ovary preparations for oral administration on the ground that there is no adequate evidence for their value and, so far, has not accepted any ovarian hormone preparation, because the evidence for the value of these was considered inadequate. (Jour. A. M. A., July 5, 1930, p. 64.)

JOHN R. BRINKLEY, QUACK

John R. Brinkley of Milford, Kansas, has for years been quacking it, but having his own so-called hospital, it has been possible for him to keep his own records, so that only by accident do the results of his work become public. The newspaper publicity that has recently been given to Brinkley is beginning to bring to light some of the crudities of his work. Brinkley's "specialty" is the alleged sexual rejuvenation of the male by the (also alleged) implantation of goats' testicles into the human scrotum. Naturally, the deluded individuals who go in for this particular line of medical humbug are not going to complain after they have found that they have been swindled. If Brinkley had been shrewder, he would have confined his quackery to this particular field. More recently, however, he has been going into the treatment (still alleged) of prostate trouble and, naturally, men do not have the same hesitancy about discussing operations for the relief of pathologic conditions of the prostate that they do in talking about sexual rejuvenation. The Kansas City Star, which has been giving its readers a great deal of information about Brinkley's methods, has now published some interesting material from Brinkley victims who throw light on the way in which he uses his radio station to get in touch with persons and how he treats them at his hospital. (Jour. A. M. A., April 26, 1930, p. 1339.)

THE CLINICAL ASPECTS OF SCLEROTIC CHANGES IN THE AORTIC VALVE*

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SCLEROTIC changes in the aortic valve consist of connective tissue thickening and commonly of calcification of the valve leaflets. The calcification may be for the most part at the bases of the valves on one or both sides of the leaflets, may prevent complete opening during systole, or may accompany an adherence of the valve leaflets, producing an osseous-like rigidity of the valve. The outstanding result of the sclerosis is a stenosis of the valve, and often there is an accompanying insufficiency.

The pathologists have recently become much interested in this not infrequent autopsy finding. There is no agreement among them as to the etiology of the sclerosis, but there is a growing opinion among them that a senile sclerosis does not explain the picture. Microscopically, the picture is difficult to distinguish from terminal changes in this valve resulting from known previous rheumatic or endocarditic infection. Clawson has failed to find cholesterol in microscopic sections of these sclerosed valves, which is characteristic of senile sclerosis. There are good arguments for accepting either view as to the etiology of the sclerosis.

It is logical to conclude, when at autopsy there is other evidence in the heart of previous rheumatic disease, that the sclerosis is scar tissue healing of an old endocarditis. Clawson, who has collected a series of seventy-five cases of sclerotic aortic valves, tells me that he has found evidence of a fibrous or adhesive pericarditis in 14 per cent of his cases. There was evidence of a previous rheumatic mitral lesion in 29 per cent of these same cases. However, with this complication the age incidence of the patients was lower.

On the other hand, sclerosed aortic valves are most frequently found in elderly individuals, the male predominating. Often the aortic valve is the only valve showing abnormality. There is usually evidence of marked generalized arteriosclerosis, but it is not uncommon to find little or no atheroma of the aorta in these cases. In many instances there is no history of a preceding rheumatic infection nor of previous symptoms suggesting an endocarditic infection. This lack of history does not, of course, rule out a previous infection of this sort for we know that such an infection can involve the endocardium and go undiagnosed due to lack of arthritic or other characteristic manifestations.

The recognition of these sclerotic changes in the aortic valves means the diagnosis of aortic stenosis and often stenosis with regurgitation. The predominant lesion is stenosis. In most cases the stenosis at autopsy is obvious. The determination at autopsy of the presence of an accompanying insufficiency of the valve in many cases may be largely a matter of individual judgment, but in some instances there is no room for doubt that the valve is also a leaky one. Until we have a method of testing the competency of a valve in vivo we cannot always feel sure of the presence or absence of a valve insufficiency. Aortic regurgitation alone on a purely sclerotic basis probably does not exist any more than an aortic stenosis alone on a luetic basis.

The diagnosis of aortic stenosis is often difficult. Cabot states that the direct evidence is rarely sufficient for a diagnosis. Where regurgitation accompanies the stenosis in these sclerosed aortic valves the regurgitation is even more difficult to detect, as the usual signs of aortic regurgitation may be almost entirely absent. However, with the evidence available, both direct and indirect, it does seem that we should be able to diagnose the presence of a sclerotic aortic valve more often than we do.

The following four patients were rather carefully studied, three of them on my service at the Ancker Hospital, and the fourth (case three) was examined by me, but was attended and correctly diagnosed by Dr. A. R. Hall, to whom I am indebted for the privilege of including this report. All four patients came to autopsy.

Case 1.—C. W., a male aged 66, and a laborer, was admitted to the Ancker Hospital April 10, 1927, complaining of dyspnea, anorexia, precordial pain, weakness and cough. His symptoms had begun three years

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previous, and he had been confined to his bed eight weeks before admission. He had never had rheumatic fever.

On examination, orthopnea was present and slight cyanosis noted. A tortuous, sclerotic, pulsating vessel was palpable just median to the insertion of the right sterno-mastoid muscle. A broad, but not forceful, apical heart beat was palpable in the fifth interspace 13 cm. (by projection) to the left, and the right border was percussed 4 cm. out. No basal thrill was felt, and there was no increase in the mediastinal dullness. There was a faint systolic murmur heard at the apex transmitted to the left. The pulmonic second sound was accentuated. A harsh systolic murmur was heard over the entire precordium, loudest at the second interspace to the right, but not transmitted into the vessels of the neck. Râles were heard over the lung areas, and there was a hand's-breadth area of flatness at both lung bases posteriorly. The radial pulse was scarcely palpable, but there was a marked sclerosis and calcification of the radial and brachial arteries. The pulse rate ranged from sixty to seventy. The blood pressure was 128/82 and later 160/90. Marked generalized edema with casts and albumin in the urine developed before death June 8, 1927.

At autopsy, the heart measured 16 cm. in diameter, weighed 560 grams, and both ventricles were markedly dilated. The left ventricle was definitely hypertrophied. The mitral, tricuspid and pulmonary valves were normal. The aortic valves were markedly sclerosed and calcified, two of the leaflets being fused for 1.5 cm. along the borders. Irregular calcified nodules were present in both sides of the aortic valve leaflets, more marked in the aortic sides. The aorta was thin and somewhat dilated, and the intima showed no atheroma. The coronary arteries were calcified, but the lumina were not narrowed. The myocardium showed definite areas of scarring, for the most part in the left ventricle. Mural thrombi filled the left auricle and were present at the tip of the left ventricle.

The noteworthy points in this case were: (1) the undoubted existence of aortic stenosis without transmission of the murmurs into the neck, nor the presence of a thrill; (2) in spite of an aortic regurgitation undoubtedly present, blood pressure reading of 128/82 and 160/90; (3) a murmur at the apex transmitted to the left without organic disease of the mitral valve. Either a relative mitral insufficiency was present, or the aortic stenotic murmur was transmitted to the apex and to the left of the apex.

Case 2.—G. McT. a male aged 61, was admitted to the Ancker Hospital January 21, 1929, complaining of shortness of breath, swelling of the ankles, cough, nervousness, and loss of forty pounds in weight. Shortness of breath had begun two years before, and was noticed on walking fast. A slight cough for several years had become more troublesome the past six months. There was no definite history of acute rheumatic arthritis, although fifteen years previous he had had pains in the knees relieved by extraction of teeth.

The patient had a dusky cyanosis. The heart apex was palpable in the fifth interspace 10.5 cm to the left. A systolic murmur was heard at the apex, transmitted to the left, and the pulmonic second sound was slightly accentuated. A different pitched, harsh, systolic murmur was heard over the first and second interspaces on the right, also at the second interspace on the left, and was transmitted into the vessels of the neck, more markedly on the left. The aortic second sound was reduplicated. No thrill nor diastolic murmur was noted. The radial vessels were tortuous and sclerosed, the pulse rather small, and of low tension. A general edema involving the pleural and peritoneal cavities, legs and thighs, and a large liver were present. The pulse ranged from seventy to ninety, but he had been taking digitalis for several weeks before admission. The blood pressure was 120/80. The urine was normal, and the blood Wassermann was negative.

The patient died February 2, 1929, of bronchopneumonia, and at autopsy the heart measured 16 cm. in diameter, and weighed 615 grams. There was a slight thickening of the free margins of the mitral leaflets, but a marked stenosis of the aortic valve due to fibrosis and calcification involving chiefly the ventricular surfaces of the valves. There was mild calcification of the coronaries and the heart muscle was pale.

The presence of a reduplicated second sound at the base in this case is against the presence of an accompanying aortic regurgitation and no mention of the probable existence of a regurgitation was made in the autopsy report. A different pitched apical murmer is not conclusive proof of a mitral regurgitation having been present.

Case 3.—Miss E. E. aged 80, was examined before her admission to the Miller Hospital under the care of Dr. A. R. Hall, on December 12, 1927. Her complaint was general weakness, pallor, and shortness of breath. She had been fairly well until about two months previous, when marked shortness of breath on exertion was noticed, which had been progressive. Swelling of the abdomen had also occurred. She had never had rheumatic fever.

On examination, the patient was markedly dysneic on lying in bed. A marked anemia was present, and a slight cyanosis. The pulse rate on admission was 68, but later ran as high as 120. The heart was enlarged to the anterior axillary line, and there was a diffuse cardiac impulse. No thrill was palpable. A rough systolic murmur was heard over the entire precordium. Moist râles were heard in the chest. The abdomen was distended, but there was no evidence of fluid. There was a slight edema of the ankles.

The blood pressure was 130/82; R. B. C. 2,160,000; hemoglobin 46 per cent. *X*-ray showed a left-sided enlargement with the mitral configuration and no widening of the aortic arch. The electrocardiogram showed a left ventricular preponderance.

Death occurred January 9, 1928. At autopsy the

heart was extended to the left costal margin and weighed 360 grams. The muscle was pale and flabby. The coronaries were patent. The heart valves were normal except the aortic, which was thickened, very rigid, and admitted just the tip of a finger. The valvular thickening was more marked at the base and on the inner surfaces, producing a marked irregularity. The edges of the valves were thin, and contained no calcium deposits. The root of the aorta contained numerous atheromatous patches and some deposits of calcium salts.

The accompanying anemia in this case doubtless accounted for some of the symptoms, and a very definite myocardial weakness. Although the heart was very large, it weighed only 360 grams. The murmur at the apex was apparently the same as that heard at the base.

Case 4.—J. M. L., male, aged 69, was admitted to the Ancker Hospital April 15, 1930, complaining of shortness of breath and a choking sensation of two weeks duration, a general weakness, and a swelling of the feet. His history of shortness of breath on exertion went back at least to the fall of 1928, when he was in the hospital with the same complaint. At that time he was diagnosed hypertension, with the highest blood pressure reading of 124/105, and also had an auricular fibrillation. He had been a laborer all his life, and had not had rheumatism.

The patient was poorly nourished, orthopneic, and somewhat cyanotic. There was a diffuse, heaving, cardiac impulse, and the heart apex was palpable in the sixth interspace 12.5 cm. to the left (projection) and the right border was percussed 5.5 cm. from the midline. The cardiac ryhthm was typical of auricular fibrillation. A blowing, systolic murmur was heard at the apex and transmitted to the axilla, and no second sound was heard. The pulmonic second sound was accentuated at one time. A faint, medium pitched, rasping, systolic murmur was heard over the second interspace both on the left and on the right, and was transmitted to both subclavians and common carotids. No thrill was felt and no diastolic murmur heard. The radial and brachial arteries were tortuous and sclerosed. There was a two-finger dullness at the right lung base, and numerous râles were heard at the left lung base.

The electrocardiogram showed an auricular fibrillation, and a low tension in the Q. R. S. complex (rate 150). The Wassermann was negative. The *x*-ray showed the heart measuring 17.5 cm. in diameter with a left ventricular type of enlargement and evidence of fluid at the right lung base. Blood pressure was 140/100.

Diagnosis: Aortic stenosis (calcification); auricular fibrillation with cardiac decompensation.

The patient improved considerably, but rapidly failed before his sudden demise on May 8, 1930.

At autopsy, the heart weighed 468 grams. The pulmonary tricuspid and mitral leaflets were normal in appearance. There was a definite thickening of the aortic cusps, with calcification most marked near the attachments of the leaflets. The aortic side of all the leaflets showed definite, raised, calcified nodules. A definite stenosis was thought to be present and also a certain degree of insufficiency. The coronary arteries were moderately sclerosed but there was no evidence of occlusion. The myocardium was brownish in color, and there were numerous fine scars present throughout the left ventricle. The root of the aorta showed some calcification but the rest of the aorta was smooth.

The points worth noting in this case were: (1) the absence of the second sound at apex and second interspace on the right suggesting an aortic regurgitation; (2) the faint systolic basal murmur due undoubtedly to the weak left ventricular action.

SUMMARY

1. The four cases reported were all in elderly individuals none of whom had a rheumatic history nor, if we except a slight thickening of the mitral valve in Case 2, a demonstrable lesion in any but the aortic valve.

2. In all four cases, stenosis of the aortic valve was the predominating lesion. A striking feature was the absence of a systolic thrill in any of the cases reported. This was probably due to an insufficient velocity of the blood stream as a result of a weak myocardium.

3. Although the aortic valve was doubtless insufficient in some of the cases reported, no diastolic murmur was heard in any of the cases. This was doubtless due to the accompanying stenosis which prevented an elevation of the systolic blood pressure and thus the pressure and velocity of the return blood flow through the aortic valve was insufficient to produce a murmur.

4. The pulse pressure in all four cases was within normal limits in spite of regurgitation undoubtedly being present in at least some of these cases. The only explanation of this phenomenon is that the greater the stenosis, the less the regurgitation possible, and the regurgitation is not sufficient to noticeably affect the pulse pressure.

5. Systolic murmurs heard over the mitral region and transmitted to the axilla were not due to demonstrable lesions in the mitral valve. While they may have been caused by a relative mitral insufficiency, they were probably the transmission of the murmur produced by the stenosed aortic valve.

6. Atheroma of the aorta was not an outstanding feature in these cases although there was evidence of marked arteriosclerosis elsewhere in every case reported.

CONCLUSIONS

1. Sclerotic changes in the aortic valve are relatively common in elderly individuals, especially in men.

2. Aortic stenosis is the predominating lesion produced by the sclerosis, but in many instances there is also an accompanying aortic insufficiency. The presence of the stenosis obscures the findings usually diagnostic of aortic regurgitation such as diastolic murmur, increased pulse pressure, and Corrigan pulse.

3. A systolic thrill is frequently absent in these cases, probably due to a lessened velocity of the blood stream passing through the aortic valve as a result of a myocardial weakness.

4. The etiology of the sclerotic process is so far undetermined. Rheumatic involvement of the aortic valve alone is supposedly unusual. No explanation can be given why a senile sclerosis should pick out the aortic valves.

5. The diagnosis should be possible with the finding of a harsh systolic murmur of maximum intensity at the second interspace to the right, transmitted into the vessels of the neck, left ventricular hypertrophy, marked arteriosclerosis in the peripheral arteries, and a small, slow pulse. If there is a marked left ventricular dilatation as well as hypertrophy, a faint or absent second sound, the probable coexistence of aortic regurgitation may be assumed even in the absence of a diastolic murmur or an increased pulse pressure.

6. The sclerotic process producing aortic stenosis does not particularly shorten life, is a gradually progressive affair, and the patient usually adapts himself to a definite limitation in the field of his cardiac response.

A BAKER INSTITUTE "DIAGNOSIS."

The history of every quack concern that professes to cure cancer is monotonously alike. The scheme consists in diagnosing every simple skin lesion, no matter how benign, as cancer. Caustics are then applied and a hole eaten in the tissues with inevitable disfigurement and the patient finally sent back home "cured." Of course occasionally the quacks get real cases of malignant disease. Most of these are sent back home in time to avoid the necessity of the "institute" having to sign the death certificate. A recent case is of interest in that the victim showed more intelligence than is frequently displayed and thus saved himself considerable suffering an disfigurement. Mr. I., an Iowa farmer, developed a lesion on the chin that worried him. He went to Muscatine to the Baker Institute where he was "examined." Mr. I. reports that he was told that he had cancer of the chin and would have to pay two hundred and fifty dollars and also sixty dollars a week hospital charges for four to six weeks. The Baker Institute, according to the victim, applied their cancer remedy. Then the young man got to thinking and decided that the Iowa State University was not far away and that they probably knew as much about cancer as Mr. Baker and his "institute." He went to the College of Medicine of the state University of Iowa where the dermatologic department diagnosed the lesion as *Tinea barbæ*. Treatment for ringworm of the beard was instituted and in less than two weeks the young man went home. (Jour. A. M. A., July 26, 1930, p. 285.)

STATUS OF TINTED LENSES*

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IT IS a fact apparent to all who give sufficient consideration to the subject that tinted lenses are being prescribed by many ophthalmologists in an aimless and indiscriminate manner. That one should have a definite therapeutic object in view when he places a tinted lens before the eye needs no affirmation. Too many refractionists, priding themselves upon the finest detail in attaining scientific accuracy in correcting refractive errors, end their careful work by placing a tint in the lens, giving no consideration to whether it is a therapeutic necessity, but only hoping that it may help. This thoughtless method of prescribing reflects the influence which is exerted by optical firms, who by extensive advertising campaigns lead astray the unwary refractionist inclined to follow routine procedure instead of treating each case as an individual and applying therapeutic measures as they are indicated.

As a result of this routine method of prescribing there are at present a large number of individuals with healthy eyes wearing glasses with a tint which is not only unnecessary for protection but which is actually harmful to retinal adaptation. The healthy eye used with proper hygienic consideration and under normal conditions, making exception, of course, to the extraordinary conditions existing in certain climes or occupations, needs no protection from either the visible or invisible rays.

A great deal has been written about the harmful effects produced by the ultraviolet end of the spectrum, and no doubt many a tint has been placed in a glass to obviate the harm caused by ultraviolet radiation. It is true that this radiation in sufficient concentration has a decided injurious effect upon certain structures of the eye, as has been amply proved by clinical observation and experiment, and even in the concentration present in the solar radiation a few isolated instances of injury have been reported, as in the case described by Syme[1] where a woman developed an erythematous rash and injection of her eyes on a bright summer day (Duke Elder[2] explains this by a sensitizer in the blood); but for the vast majority, nature has provided abundant protection against the ultraviolet ray.

This protection is furnished by the cornea and lens. It has been shown by experiment that the cornea absorbs all rays below 2,900 a.u. and that the lens gives even greater protection by absorbing all rays under 3,500 a.u.

When we consider that the sunlight at lower atmospheres, due to the absorption in the higher atmospheres, contains very few rays under 3,500 a.u. and the lower limit is reached around 2,900 a.u., we realize how well the eye is protected against this particular radiation. According to Abbott,[3] the percentage of waves between 3,050 and 2,910 a.u. at ordinary altitudes averages about 0.25 per cent of the total solar spectrum. Lawson[4] says that in the laboratory the ultraviolet waves average about 200 a.u. It is therefore obvious that it is impossible for very much of the ultraviolet ray to reach the retina under ordinary circumstances.

In granting protection from the heat, or infrared radiation, nature has again been liberal. Injury to the superficial portion of the eye is prevented to a large extent by the moist surface. According to Fuchs,[5] the water in the media absorbs so much of the heat radiation that little, if any, reaches the retina at all. Vogt[6] states that about 25 per cent reaches the superficial portion of the vitreous but causes no harm unless very intense and of long duration. So far as the visible spectrum is concerned, it causes no ill effects unless it is very intense and produces dazzling. As Lawson observes,[4] "The eye of all human races is self-adapted to endure without harm the sunlight of that part of the world in which they live."

The self-evident fact that colored lenses cut down the intensity or brightness of light of necessity raises the question whether this decrease of luminosity is harmful or beneficial. As pointed out by Ferree and Rand,[7] "Increase of the intensity of white light gives a greater power for clear seeing through its enabling the retina

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to perceive greater detail. Secondly, with a given difference in coefficient of reflection between an object and its background the sensation difference is increased with the intensity of light. Therefore, greater visibility is produced. Thirdly, it narrows the pupil, thus resulting in fewer aberration effects and narrowing the cone of light, which in turn decreases the size of diffusion circles. The effect of increased intensity is to speed up clear seeing, lessen fatigue, and prevent ocular discomforts."

The blurred image of the ametropic eye is cleared considerably by increasing the intensity of light, thereby allowing the retina to see more detail. According to Ferree and Rand,[7] an eye which is corrected for medium and high intensities of light may give much trouble when used in lower intensities. If this is true, it is reasonable to expect that eyes corrected for the light intensities ordinarily used in test charts would not be benefited but would be harmed by tinted lenses, which automatically tone down the intensity of light and force the eye to work in a decreased brightness. Such individuals demand more light to counteract the effect of the colored glass. Increased intensity of light is especially important in elderly people. They have less difficulty in seeing near objects and there is a greater range over which clear seeing is possible. In myopes and hyperopes there is an abnormal relation for accommodation and convergence. In these the strain of attempting to see clearly is much reduced by high intensities of light. It is not, then, the brightness of light which produces the asthenopic symptoms, but it is the faulty lighting arrangements, which cause a faulty distribution of light. Instead of lowering the brightness, more attention must be paid toward effecting a proper distribution. This entails, first, the elimination of unevenness of illumination, which produces glaring and brilliant surfaces; second, the proper diffusion of light; third, careful attention to the angle of incidence; and, fourth, elimination of high brilliancies in the field of view.

It is apparent that many ophthalmologists do not properly appreciate the power of the normal retina for adapting itself to the various degrees of illumination to which it is subjected. This process of adjustment to the illumination present is an experience common to all. An individual who goes from a brightly lighted room into a dark one at first sees nothing, but the longer he stays in the room the more his vision adjusts itself, so that finally he is able to distinguish objects about him. After his vision is adjusted, if he again returns to the brightly lighted room, he finds that at first he is so dazzled that he sees poorly, but after a time the sense of dazzling and poor vision disappears.

This power of the eye to adjust itself to the illumination present is called adaptation, or, specifically, light adaptation. By this process the healthy eye is adjusted to broad ranges of varying illumination and this adaptive power is fully sufficient to keep the eye healthy in all degrees of solar illumination.

It is a fact easily comprehended that tinted lenses impair light adaptation by preventing its exercise, and if it were generally recognized that healthy adaptation is necessary, there would be fewer eyes weakened and made less useful by tinted lenses.

In a statement embodying the principle that tinted lenses are not necessary for a healthy eye, certain abnormal conditions must be considered as modifying factors. These include, first, the intensity of the light to which the eye is subjected; second, the duration of the exposure; third, the presence of glare; and, fourth, the occupation of the individual.

Where a person is subjected to intense degrees of sunlight, protective lenses become an absolute necessity. This condition arises in high altitudes where the absorptive properties of the atmosphere are not so great and consequently there is a high concentration of radiant energy. Experiment has shown that the chief danger lies, not in the ultraviolet radiation, but in the infra-red. Prolonged exposure, even in healthy eyes, produces its effect by lowering the resistance of the individual.

Glare, which is defined as the unpleasant effect produced by excessive reflection from below, is usually caused by reflection from large bodies of water, snow, ice, sand or rock. This light itself may be of moderate intensity, but when reflected from a large body of snow, produces an intense effect. It is estimated that snow reflects 70 per cent of the sunlight. According to Lawson's experiment,[4] the effects of glare are produced by the luminous and infra-red portions of the spectrum. Snowblindness is in reality a sunburn of the conjunctiva. Certain occupations

and trades produce effects from radiant energy due to the excessive concentration of certain wave lengths. It is a fairly well established fact that there is a type of cataract produced in individuals who are subjected to intense heat waves. The ultraviolet wave plays an important role in the ocular disturbances manifested in acetylene welders.

In certain disease conditions of the eye, or in structural defects, either congenital or acquired, it becomes necessary for the individual to use a tinted lens to alleviate the photophobia which is an accompaniment of his ocular disturbance; for here the eye must be protected from ordinary sunlight as there is great sensitivity to light, and here we must put the eye at rest, for, as Fuchs[5] says, the eye is stimulated by light to the performance of its function and shutting out the light is the first requisite.

Photophobia, defined as the discomfort and sense of dazzling and blindness produced by light, originates both in the terminal fibers of the trigeminal nerve and in the retina. These nerve terminals end mostly in the cornea and for this reason superficial inflammations of the cornea are accompanied by marked photophobia. Since the iris has an abundant supply of sensory nerves, there is also marked photophobia when it becomes inflamed. In diseased conditions of the retina photophobia may be a marked symptom, but here it is not the sensory fibers that play a role, but the optical fibers which carry the reflex to the pupil.

Among the structural defects for which a tinted lens is advisable may be mentioned albinism, coloboma of the iris, and aphakia. It may be well here to call special attention to the need for a tinted lens for the aphakic eye. After the extraction of a cataract the eye is deprived of its most effective protection against the ultraviolet light and all aphakic patients should wear a tinted lens out of doors, except on dark days.

When we place a tinted lens before the eye, we have for our object the total or partial elimination of certain spectral radiations. We can, by selecting certain types of glass combined with certain colors, confine our results to particular areas of the spectrum. As mentioned above, the harmful effects of radiant energy are produced by the rays from three portions of the spectrum —the ultraviolet portion, the visible portion and the infra-red portion. It is known that certain types of glass produce this result in a selective manner and in general can be arranged in three groups. In the first group we have the ordinary colored glasses which are produced with no scientific basis and recommended for general use in healthy or diseased eyes. In the second group are those which absorb the ultraviolet rays and in the third group are those which absorb the heat rays. In late years there has been placed on the market a glass which is recommended for absorption of visible rays only.

It is generally agreed that the elimination of the ultra-violet radiation is a simple matter and glasses recommended for this purpose, such as Hygat, Euphos, Crookes and Ultrasin, are quite satisfactory.

In 1925 Sir Arnold Lawson[4] carried out a series of experiments to determine the absorptive power of various tinted lenses. In these studies he used: (1) No. 3 London Smoke; (2) three shades of amber; (3) four shades of Fieusol; (4) Crookes A, A2, B, B2; and (5) peacock blue. Concerning the ultraviolet rays, he concluded that the darker shades of Fieusol were the most effective. Very close to these were placed the Crookes glass; then came amber, and least protective of all was London smoke. All three shades of Crookes were equally effective and did not protect the eye from ultraviolet radiations under 3,500 a. u. The only tints which cut off the ultraviolet completely were the darker shades of Fieusol. Lawson recommended these instead of Crookes for acetylene welders or for use in high altitudes.

In respect to the heat rays, the protecting glasses in general use are deficient, for, as pointed out by Imre,[8] they not only fail to give the desired protection but actually lengthen a considerable quantity of the visible rays and change them to heat rays and thus produce heat behind the glasses. Imre[8] advises that these rays be held back, not by absorption, but by reflection. For the accomplishment of this result he advises the use of thin, transparent, metallic layers which admit a sufficient quantity of the visible spectrum but at the same time have great reflective ability. He has shown that glasses covered with a thin metallic layer of platinum or gold can protect the eye equally from ultraviolet and infra-red and that the visible spectrum can be admitted in any desired quantity. In his clinical practice he finds that the metallic glasses

are very agreeable to the patients, as there is no accumulation of heat behind them, but rather an actual feeling of coolness.

In his experiments Lawson[4] finds that peacock blue is most effective for infra-red absorption and that this is closely followed by Crookes B2 and F 4 & 5, amber being less effective than either.

The luminous rays are cut out equally well by all glasses, but Fieusol 4 & 5 are superior to Crookes in high sunlight and glare, and peacock blue is best in extreme cases.

For active inflammatory conditions in the eyes, Lawson[4] advises the use of peacock blue. Imre[8] is quite enthusiastic over the results obtained in these patients with the use of metallic reflecting glasses. He points out the advantages of less heat production behind the lens. This heat, he maintains, dries the cornea and results in blinking and increased tear production, thus irritating the inflamed eye. From his observation he concludes that these patients are far more comfortable with the reflecting glasses and that the cure is greatly accelerated.

The prescribing of tinted lenses for the apparently healthy eye without tangible and sufficient reason for so doing is a practice to be condemned. It is no more logical and fully as reprehensible to place such a glass before an eye as it is to routinely add a +1 diopter lens for reading because the patient is forty-five years old. It is not only unscientific, but in many cases positively contraindicated. When we stop to realize that under ordinary circumstances the sound eye needs no protection against ultraviolet ray and that the tinted lens cuts down the visible rays from 15 to 35 per cent or more, depending upon the shade, it is inconceivable that we prescribe a tint without full and sufficient reason. The retina is stimulated into activity by visible rays. Any means which lessen this stimulus interfere with the perceptive apparatus to some extent. It is true that certain individuals with apparently sound eyes are made miserable in ordinary sunlight. These individuals may be pathologically affected, in that adaptation is slow or that adaptation, when once effected, is below normal, or they may in reality be mentally or physically abnormal. Very often in physical diseases or neurasthenia, the general function of the eye is impaired and in this type of patient help is needed.

Where the glare exists in moderate amount, attention should be directed to the lighting arrangement and hygienic measures before the easier method of tinted lenses is employed. If this were done, many cases of asthenopia attributed to light effects would be cured without cutting down the luminous spectrum.

In the myopic eye a tinted lens is more often needed. Here it is advisable to use a soft tint to cut down the sharpness of the image.

Ophthalmologists, then, should not be misled by advertising claims of various optical houses which for pecuniary reasons alone seek to popularize the routine prescribing of absorptive lenses, but should consider the absorptive glass as a therapeutic procedure to be used when indicated, and realize that it can be just as harmful to certain eyes as it can be helpful to others.

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STONE IN THE UPPER URINARY TRACT: ITS CLINICAL MANIFESTATIONS AND TREATMENT*

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THE clinical picture of stone in the kidney or ureter in the majority of cases is typical. Possibility of the presence of renal or ureteral stone is at once suggested by the history of sharp severe pain beginning in the lumbar region and radiating forward and downward into the genitalia. Such pain is spoken of as renal colic and is scarcely ever mistaken for pain produced by other conditions. Morphine is required and the attack usually ends spontaneously. In many cases complete relief is experienced until a second similar attack occurs. In other cases, in the interval between colics there is constant dull achy pain in the flank of the affected side.

Not infrequently typical colics do not occur and the character of the pain is not suggestive. There may be only a dull achy pain which does not radiate though its location in the flank at once suggests the possibility of renal origin. In other cases not even flank discomfort may be noticed. This is particularly true with ureteral stone. Here there may be only vague discomfort in the upper or lower quadrant. Even the helpful lead that unilateral distribution offers may be lacking, the patient complaining only of vague generalized abdominal discomfort. Because of the atypical character and location of the pain many of these cases are mistaken for cholecystic disease, appendicitis, intestinal obstruction, and other intra-peritoneal conditions. Deaver has said that the possibility of renal or ureteral stone should be considered in any case of unexplained abdominal pain.

Of importance in the history of these cases is the character of the urine voided during or after an attack of pain. When gross hematuria is reported the presence of some lesion in the urinary tract is established and we need no longer concern ourselves with intra-peritoneal possibilities. In more than half the cases the voided urine is reported grossly clear. Unless the specimen is submitted to microscopic examination this fact is of no value in the history. When examination has been made in these cases of clear urine a few red cells are almost regularly found, though their absence does not rule out stone.

In a considerable number of cases, during attacks of pain there suddenly occurs some degree of bladder irritation. When this is marked there is an almost constant and severe desire to void which compels voiding every few minutes with several urethral burning and terminal tenesmus. In other cases the irritation may be nothing more than itching discomfort referred to the urethra and bladder associated with an abnormally frequent but not compelling desire to void, the actual number of voidings being no more frequent than normal. In many cases the bladder irritation immediately disappears with the end of the pain. In other cases the irritation continues and may eventually become the chief symptom complained of. This is particularly true in the event of infection occurring as a complication of calculus disease. Examination of the urine in these cases will show pus cells, and when the infection is marked the urine is often quite cloudy.

The history of the passage of a small stone or gravel during an attack or some time later is, of course, conclusive evidence that stone has been present in the kidney or the ureter. This occurrence is reported in the history of approximately one-third of the cases. When the passage of stone is followed sometime later by persisting flank pain, repeated attacks of colic, bladder irritation, or the voiding of bloody urine, it may be assumed either that multiple stones are present, recurrence of the stone has taken place, infection has occurred, or that some other condition of the upper urinary tract associated with the presence of stone is the cause of these symptoms.

The examination of these patients should contemplate more than mere proof or exclusion of the presence of stone. The exact location of the stone can and should be demonstrated. Associated conditions of kidney or ureter which may have influenced the formation of the stone or are likely to invite its recurrence should be discovered and their importance appraised. Among the conditions found associated with calculus disease that may be considered important in this

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way are loose sagging kidney with kinking of the ureter, anomalous renal vessels causing obstruction at the uretero-pelvic junction, various other forms of ureteral obstruction such as stricture and partial stenosis of the uretero-vesical orifice, various abnormalities associated with obstruction, and finally persisting upper urinary tract infection. Most of the conditions mentioned interfere mechanically or otherwise with the peristaltic activity of pelvis and ureter essential to normal movement of urine and prevention of stasis.



Fig. 1. Plain *x*-ray. Branched stone in right kidney. Medium sized stone in left kidney.



Fig. 2. Bilateral pyelograms. Advanced hydronephrosis of right kidney. Stone in right kidney pelvis. Uretero-pelvic junction obstruction due to aberrant renal artery.



Fig. 3. Plain *x*-ray. Faint shadows in region of right kidney tracing the outline of calyces. (Pyelogram localized these shadows in pelvis.) Single oval shadow above (cortical stone).

Any degree of obstruction impedes the passage of urine from the kidney to the bladder, causing stasis of urine in the kidney pelvis in early cases and hydro-nephrosis in advanced cases. In the cases in which there is an inherent tendency to form stones, recurrences are more likely when there is any degree of obstruction in the kidney or ureter.

Of importance in the management of these cases is the condition of the upper urinary tract on the other side. This information is particularly needed in the cases with stones in both kidneys, since experience has shown the wisdom of operating first on the functionally and anatomically better kidney. In cases of calculus pyonephrosis knowledge that the remaining kidney is capable of good function is essential before nephrectomy can be undertaken safely.

The clinical picture of renal and ureteral stone has been described. Associated conditions frequently found in the examination of these cases that serve as contributing causes in the formation and recurrence of stone have been pointed out. The destructive changes in kidney and ureter resulting from stone have been alluded to and will be further emphasized in connection with the cases to be reported. It is also our purpose to present the treatment of renal and ureteral calculus. In many cases removal of the stone will be sufficient. In cases in which associated conditions are present it will be necessary also to correct these, thus rendering recurrence of stone less likely. The indications for treatment and the various procedures employed are illustrated by summarized clinical records of typical cases, representing many of the circumstances in which stones in the kidney and ureter are found. These reports will also serve to illustrate the diagnostic methods employed in these cases.

Case 1.—Female, 38 years.

Complaint—Frequency of urination. Pain in right flank. Hematuria. Discomfort in left flank.

Present Illness—Began two years ago, following last pregnancy, with pain, frequency and hematuria. Periods during which she voids, every half hour by day and once during the night. Attacks of dull aching pain in right flank prior to one year ago, at which time a severe attack of colicky pain. No typical radiation. Repeated hematuria. Recently vague discomfort in left flank. Tenderness to deep percussion in both flanks.

Urine—Clear. Microscopic: 100 pus cells, moderate number red blood cells.

Plain X-ray—In right kidney field is a large branched stone. In left kidney field is a smaller shadow toward the lower pole (Figure 1).

Cystoscopy—Bladder mucosa shows chronic inflammatory change over trigone and floor. Indigo-carmine

appeared in 5 minutes on left with poor concentration; on right side in 7 minutes, even poorer concentration.

Pyelograms—Left pyelogram shows slight dilatation of minor calyces. Shadow localizes in inferior calyx.

Diagnosis—Renal calculi, bilateral, with infection.

Treatment—Left pelvio-lithotomy (left kidney function best). Complete relief of left sided symptoms.

Three months later right nephrotomy, with removal of multiple calculi. Complete relief of right sided symptoms.

COMMENT

The better kidney was operated upon first for the following reasons: Better function, fairly good anatomic condition, and the presence of a relatively small stone which could be removed by pyelotomy, the preferred procedure. With the function of this kidney improved, radical removal of the branched stone from the remaining kidney was undertaken safely.

Removal of either kidney is avoided in these cases of bilateral lithiasis because of the frequency of recurrence of stone on one or both sides. Even the employment of wide nephrotomy for the removal of large branched stones is justifiable and should be performed in cases in which marked damage of the kidney parenchyma has not occurred. The danger of postoperative hemorrhage following this procedure demands careful hemostasis and this is accomplished by tightly approximating the margins of the calyces with a strong continuous suture after the method of Schwyzer, fortifying this with several deeply placed mattress sutures through the cortex.

Case 2.—Male, 56 years.

Complaint—Hematuria, frequent painful urination. Pain over the bladder.

Present Illness—Four months ago noticed dark chocolate colored urine associated with slight frequency, nocturia two to three times, slight urgency but no burning at urination. Urine cleared in a few days but slight frequency and urgency continued. Bloody urine occurred on four or five occasions. Pain in bladder region at times. Fifteen years ago passed a small stone. Physical examination negative.

Urine—Dark but clear. Microscopic: many pus and moderate number of red blood cells.

Plain X-ray—Large oval shadow in right kidney region.

Cystoscopy—Bladder normal. Slight redness of right ureteral orifice. Indigo-carmine appeared in 7 minutes on the left in good concentration. No dye seen on right after 12 minutes. Ureters catheterized. Seventy-five c.c. cloudy urine aspirated from right kidney, no dye coloring.

Pyelograms—Marked dilatation of right pelvis and major calyces (Figure 2).

Diagnosis—Right hydro-nephrosis. Uretero-pelvic junction obstruction, due to anomalous artery. Renal calculus.

Treatment—Nephrectomy. Complete relief. At operation an anomalous artery accounting for the uretero-pelvic junction obstruction was found.

COMMENT

This case illustrates the production of hydronephrosis due to obstruction at the uretero-pelvic junction by an anomalous renal artery. It is probable that stone formation in this patient was secondary to the stagnation of urine in the kidney pelvis caused by the obstruction. Marked damage to the kidney had occurred and nephrectomy was the rational procedure. In other cases seen earlier, hydro-nephrosis may not be so advanced and the kidney may still be capable of recovering a good deal of its function if the obstruction is corrected at the same time the stone is removed. In such cases conservative surgery is indicated and the anomalous vessel is divided and the stone removed through an incision in the pelvis.

Case 3.—Male, age 45.

Complaint—Pain in right lumbar region.

Present Illness—One year ago sudden attack of sharp pain in right lumbar area radiating into inguinal region. Dull pain ever since. Patient unable to work because of pain. No urinary symptoms. Marked tenderness to deep percussion in right flank.

Urine—Clear. Microscopic: occasional pus cell, no red blood cells.

Plain X-ray—Oval shell-like shadow, size of olive, opposite second lumbar vertebræ on right. Group of shadows in right kidney area closely tracing outline of upper and middle calyces (Figure 3).

Cystoscopy—Slight cystitis confined to trigone. Ureteral orifices normal. Clear jets of urine from each.

Pyelograms—Right pyelogram, moderate hydronephrosis. Oval shadow outside pelvis. Faint shadows localized in upper and middle calyces. Left pyelogram, slight dilatation of true pelvis, sharp bend in ureter.

Diagnosis—Calcareous pyelo-nephritis, right. Cortical renal stone, right.

Treatment—Right nephrectomy after exploration showed impossibility of removal of fine stone particles, and because of good anatomic condition of left kidney. Complete relief.

COMMENT

In this case a kidney capable of good function and showing only moderate anatomic change was excised because it was found impossible to remove all the fine calcareous particles scattered throughout the pelvis and calyces. Any one of these particles would have served as a nucleus for further stone formation. It was also apparent that this calcareous material was due to infection of the kidney by urea splitting organisms of the bacillus proteus group with the for-

mation of alkaline urine and the precipitation of inorganic salts. Infection of the bladder with organisms of this group is responsible for the condition called alkaline incrusted cystitis. All cases of infection of the kidney in which cultures of ureteral catheter specimens show organisms



Fig. 4. Bilateral pyelograms. Horse-shoe kidney. Left renal calculus.



Fig. 5. Left pyelogram. Left ectopic kidney with stone.



Fig. 6. Left pyelo-ureterogram. Moderately advanced hydronephrosis and hydro-ureter. Large stone in left ureter at level of third and fourth sacral vertebra.

of this group should be submitted to vigorous treatment to destroy these bacteria and prevent the formation of calcareous material.

Case 4.—Male, 36 years.

Complaint—Pain in left lower abdomen. Hematuria.

Present Illness—Began six months ago with attacks of pain occurring at two to three day intervals. Pain worse when standing. No urinary symptoms. Blood found in urine at examination for life insurance. Tender in left abdomen along course of ureter and in left costo-vertebral angle.

Urine—Slightly cloudy. Microscopic: moderate number of red blood cells and pus cells.

Plain X-ray—Shadow on left opposite third lumbar vertebra.

Cystoscopy—Bladder normal. Clear urine from right orifice. No jets on left. Indigo-carmine appeared promptly from both sides. Concentration better on right. Ureters catheterized.

Pyelograms—Left pyelogram (Figure 4) shows abnormal rotation of kidney, calyces directed medially, lower ones almost to mid-line. Pelvis moderately dilated. Right pyelograms also show abnormal rotation with calyces directed medially. Lower poles drawn toward one another.

Diagnosis—Horse-shoe kidney. Left renal calculus.

Treatment—Left nephrotomy and removal of stone. Presence of horse-shoe kidney confirmed. Complete relief of symptoms.

COMMENT

This was a case of unexplained abdominal pain. Urologic investigation was prompted by the finding of a few red blood cells on microscopic examination of the urine. In cases of horse-shoe kidney some degree of obstruction at the uretero-pelvic junction is frequently produced by the abnormal relations of the blood vessels, the under rotation of the kidney, and its faulty position. Corrective surgery is often out of the question, and in this case removal of the stone only was performed. Recurrence of stone in this patient would not be surprising.

Case 5.—Male, age 54.

Complaint—Pain in left flank.

Present Illness—Past four years attacks of pain in left side of back. Pain radiates down into thigh. Associated with attacks of pain are periods of frequency and dysuria. At times urine is cloudy. Flank pain constant past eight months. Tenderness left costo-vertebral angle.

Urine—Clear. Microscopic: few pus and red blood cells.

Plain X-ray—Shadow 1x1.5 cm. to the left of the lower sacrum.

Cystoscopy—Bladder normal. Ureteral orifices normal. Indigo-carmine 3.5 min. on right, 5 minutes on left, with better concentration on right. F 6 catheter full length on right, 18 cm. on left. Good flow of urine from right, poor flow from left.

Pyelogram—Left kidney in pelvis over lower portion of sacrum. Calyces fairly normal. Ureter folded over. Shadow localizes in pelvis (Figure 5).

Diagnosis—Ectopic left kidney. Renal calculus, left.

Treatment—Nephrectomy. Complete relief.

COMMENT

Ectopic kidney should not be confused with a loose kidney, which occasionally migrates to the pelvis. The ectopic kidney receiving its blood supply from the aorta or iliac artery at the level

it occupies in the body is in a fixed position and its ureter is usually not redundant. A loose kidney with a much lengthened vascular pedicle is capable of considerable descent which can be demonstrated by pyelograms made in both horizontal and vertical positions and its ureter is redundant. The differentiation between these two conditions is of importance in calculus disease, since stone in an ectopic kidney is best treated by nephrectomy and a loose kidney in good anatomic condition may be appropriately treated by nephropexy after removal of the stone.

Case 6.—Female, 28 years.

Complaint—Pain in left side.

Present Illness—Attacks of pain since childhood. Attacks worse past two years. Pain begins in left lower quadrant of abdomen and radiates up into flank. Occasional passage of bloody urine. Definite tenderness to pressure in left flank and along the course of the left ureter.

Urine—Cloudy. Microscopic: many pus and red blood cells.

Plain X-ray—Fairly well defined shadow in region of lower left ureter.

Cystoscopy—Bladder normal. Chronic inflammatory reaction about left ureteral orifice. Orifice reddened and swollen. Right ureteral orifice normal. Indigo-carmine appeared more promptly and in better concentration from the right side. Resistance to passage of ureteral catheter met on left side at about 4 cm. Passage of catheter to kidney finally accomplished.

Pyelograms—Left kidney pelvis extremely dilated. Ureter markedly dilated. Shadow localized in lower ureter (Figure 6).

Diagnosis—Left ureteral stone with hydro-ureter and hydro-nephrosis. Marked infection of left kidney.

Treatment—Nephro-ureterectomy. Complete relief.

COMMENT

Removal of the entire ureter with the stone as well as the kidney is desirable in cases of marked hydro-ureter due to calculus. If only nephrectomy with removal of the stone is performed the ureter remains as an atonic hollow structure very liable to infection, if this has not already occurred. An infected blind ureter may be the cause of persistent cystitis and require removal at a second operation. In occasional cases carcinoma occurs in infected ureters remaining after nephrectomy and removal of the stone.

Case 7.—Male, 63 years.

Complaint—Attacks of pain both sides of lower abdomen. Cloudy urine. Nocturia.

Present Illness—Past three or four years feeling of distress over entire lower abdomen with occasional sharp severe attacks of pain. Pain usually on left side, but has been also on right. No radiation. Morphine for relief. No bladder symptoms but blood and pus were found in the urine after an attack. Nocturia two to three times. During the past few weeks has noticed swelling of the face and general loss of strength. No tenderness in abdomen, or flanks. General condition fair.

Urine—Clear. Microscopic: 12 pus and 60 red blood cells.

Plain X-ray—Oval irregular shadow to left of sacrum.

Cystoscopy—Bladder normal. Ureteral orifices normal. Indigo-carmine appeared in 8.5 minutes on the left and in 12 minutes on the right. Concentration of dye poor on both sides.

Pyelograms—Marked hydro-nephrosis and hydro-ureter on left. Shadow localizes in left ureter and dilatation begins immediately above (Figure 7). Marked hydro-nephrosis of right kidney pelvis, not as marked as on the left. Right ureter not well outlined.

Diagnosis—Left ureteral stone. Bilateral hydro-nephrosis, most marked on the left.

Treatment—Left uretero-lithotomy. Course of pelvic lavages and dilatations of right ureter. Complete relief.

COMMENT

Lower abdominal pain in this case was diffuse and was not suggestive of lithiasis. Here again urologic examination was prompted only by the microscopic examination of the urine. This case illustrates the value of investigating the opposite kidney even though no symptoms may have been present on that side, and bears out the contention that pyelography together with functional tests are more reliable in demonstrating the anatomic condition of a kidney than functional tests alone. In this case right renal function was within normal limits, as estimated by indigo-carmine after intravenous injection. The pyelogram of this kidney, however, showed advanced hydro-nephrosis, almost as marked as on the left side. In this case a serious mistake might have been made if the left kidney and ureter had been removed along with the stone. The function of the right kidney alone could scarcely have maintained life for any length of time. Nephrectomy would have been preferable in this patient if the right kidney had been anatomically sound. As it was, removal of the stone only was all that could be undertaken safely.

Case 8.—Male, age 29.

Complaint—Right flank pain. Hematuria.

Present Illness—Severe right flank pain began four years ago. Hematuria for two days. Pain lasted four days. Several such attacks. Morphine for relief. Ache in right flank between attacks. No bladder irritation. Marked tenderness in right costo-vertebral angle. Marked tenderness in right lower abdomen.

Urine—Clear. Microscopic: 40 pus cells, 60 red blood cells.

Plain X-ray—Oval shadow 1x0.5 cm. to right of lower sacrum (Figure 8).

Cystoscopy—Edema of right ureteral orifice. Bulging inward of bladder wall above right ureteral orifice. Left ureteral orifice normal. Bladder mucosa normal. Indigo-carmine, intravenously, appeared in three minutes from left orifice. No appearance on right after 12 minutes.

Pyelogram—Right hydro-ureter. Shadow included in ureterogram. Slight dilatation of kidney pelvis, right.

Diagnosis—Right ureteral lithiasis. Obstruction of ureter. Hydro-ureter.

Treatment—Cystoscopic manipulation. Meatotomy of right ureteral orifice. Stone extracted from ureter. Stone removed from bladder with cystoscopic Rongeur. Complete relief.



Fig. 7. Bilateral pyelograms. Advanced hydronephrosis and hydro-ureter with infection. Large stone in left ureter 5 cm. above uretero-vesicle orifice.



Fig. 8. Plain *x*-ray. Right ureteral stone just above uretero-vesical orifice. (Removed by cystoscopic manipulation.)

COMMENT

Many stones impacted in the vesical portion of the ureter or just above this point, may be removed by cystoscopic methods. Several attempts to remove such a stone should be made before more radical operative removal is resorted to. The employment of this manipulation should be contingent on: (1) good condition of the patient; (2) investigation of the case showing that nephrectomy is not necessary and that removal of the stone will be sufficient; (3) no associated conditions present in the upper urinary tract demanding operative treatment; and (4) that further significant damage to the kidney by the existing obstruction during the time consumed in these manipulations is unlikely.

Case 9.—Male, age 21.

Complaint—Pain right lower abdomen. Ache in right flank.

Present Illness—Began two months ago with sudden sharp pain in right lower abdomen, referred upward toward crest of ilium. Two such attacks since. Morphine for relief. Discomfort in right flank noticed occasionally since first attack. No urinary symptoms. Marked tenderness in right lower quadrant. Moderate tenderness in right costo-vertebral angle.

Urine—Clear. Microscopic: no pus, few red blood cells.

Plain X-ray—Indistinct shadow, small, in region of lower right ureter. Subsequent plates showed no shadows.

Cystoscopy—Bladder normal. Indigo-carmine appeared in 4 minutes on the left. No appearance on the right after 10 minutes. Ureteral catheter F 6 passed full length on right. Twenty c.c. of urine immediately aspirated from right kidney pelvis. Patient immediately experienced relief.

Pyelogram—Right pyelogram normal. Negative for stone.

Cystoscopy—Soft wax bulb passed through length of right ureter. Examination after removal showed two or three linear scratches.

Diagnosis—Right ureteral lithiasis, impacted. (Permeable stone.)

Treatment—Cystoscopy. Ureter dilated to F 12. Seven days later patient passed stone during voiding. Stone .5x.35 cm. Recovery complete.

COMMENT

This case might have been mistaken for acute appendicitis when first seen because of the nature and location of the pain and the absence of urinary symptoms. However, discomfort had been noticed in the right flank and there was tenderness in this area to palpation. Of particular interest in this case is the method employed to diagnose the stone in the ureter. *X*-ray examination on one occasion showed an indistinct shadow

but several subsequent examinations showed no shadows suggestive of calculus. Although the patient carefully strained his urine at each voiding no stone was recovered. A soft wax bulb was passed to and fro in the ureter of the affected side. This method is recommended in cases in which typical colics are repeated, no stones are passed, and *x*-ray examinations and pyelography are both negative for calculus. In many cases the presence of soft stones in the ureter that cast no shadow on an *x*-ray plate can only be diagnosed in this way.

CONCLUSION

In conclusion it should be emphasized that there are an appreciable number of cases of renal and ureteral stone with symptoms that may be indefinite or misleading. It will be necessary to keep a sharp lookout for these cases if they are to be recognized. A carefully taken history with proper appraisal of the facts obtained is essential. Cases exhibiting typical colics should never be mistaken for anything else. The presence of stone should be considered very probable in cases with pain of any sort associated with urinary symptoms. Following Deaver's axiom, any cases of unexplained abdominal pain should be suspected of having calculus. All cases exhibiting these features should be investigated. The information furnished by cystoscopy, ureteral catheterization, divided functional tests and pyelography will lead to a diagnosis and enable one to decide between conservative and radical treatment. In many cases removal of the stone will be sufficient. In all cases the possibility of associated conditions causing stasis and influencing the formation of stone should be kept in mind. In addition to removal of the stone these conditions should be recognized and corrected when present. Conservation of kidney tissue will be effected and the instances of recurrence of stone will be kept to a minimum.

LYDIN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that "Lydin," a product of the Harrower Laboratory, Inc., is claimed to be "a physiological sex-stimulant of note" consisting of a combination of "the male sex hormone" with "the antisterility fat-soluble Vitamin E." It is marketed in capsules for oral administration and is recommended for use in the treatment of impotence with the suggestion that "the indications are too well known to be enumerated." The Council publishes a report on the biologic assay of "Lydin" by T. F. Gallagher sent to the Council by F. C. Koch, head of the Department of Physiological Chemistry and Pharmacology of the University of Chicago. This study shows that when administered by mouth "Lydin" is without effect as measured on capons by the comb growth method or on guinea-pigs as measured by the spermatozoa motility test. Brown-Sequard was convinced that an extract of the testes promoted the vitality, but his experiments were not confirmed or accepted. In the meantime, the available knowledge of the glands of internal secretion has aroused commercial promoters to the exploitation of all sorts of glandular extracts and combinations without an iota of evidence to show that any preparation of extracts of the testes, singly or in combination, has ever been shown to have the slightest effect on the human body when given by mouth. (Jour. A. M. A., July 19, 1930, p. 201.)

CARCINOMA OF THE STOMACH*

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THE prevalent attitude towards carcinoma of the stomach is a pessimistic one. Such an attitude of hopelessness does not tend towards progress, either in research or in regard to aggressive treatment. The internist has in the past assumed this detrimental attitude more than the surgeon. One of our recent associates in the University Hospital told the students that the proper treatment of carcinoma of the stomach when the diagnosis was made was to give the patient some white powder in a palliative fashion, as they all soon die, from the disease. Eventually we all die, but to put this time as far in the future as possible is one of the aims of the medical profession. It is evident that to do this we must assume an aggressive attitude. It is with this spirit that we best attack the problem of carcinoma of the stomach. This aggressive spirit is just as important in the diagnostic field as it is in the surgical. This is illustrated by the following case.

D. W., aged 67, was operated upon by Dr. O. H. Wangensteen. Since August, 1929, the patient had had epigastric distress, consisting of a sensation of fullness immediately after meals, even following small meals. The use of alkalies or frequent feedings gave him no relief. The only relief he noted was obtained by belching. The patient had no history of pain, nausea or vomiting nor any food intolerance. Tarry stools were never noted. Since August, 1929, he had lost thirty pounds in weight. He was sent to the University Hospital in January, 1930. He was a white, senile, emaciated individual who was ambulatory and in no apparent distress. In his abdomen there was tenderness and pain on palpation, but no definite mass could be felt. The gastric analysis showed a total acidity of 14, but no free HCl. Occult blood was found in the stool in all examinations. Blood chemistry was within normal limits, but morphologically his blood showed a secondary anemia. The interest in this case centers itself on the gastrointestinal tract. Fluoroscopic examination by Dr. L. Rigler showed a large filling defect on the greater curvature of the stomach and within this area a large ulceration could be made out near the greater curvature. In the distal third of the stomach there was an infiltration that appeared to be more scirrhous in type and extended mostly along the lesser curvature. Some peristalsis could be made out along the greater curvature in this region. The pylorus was wide open, suggesting infiltration, and the barium meal poured through very rapidly. The whole picture was quite characteristic of an advanced malignancy with ulceration. The duodenal bulb filled out well and appeared normal. There was marked dilatation and regurgitation in the second portion. At the end of six hours the head of the meal was in the cecum and a small amount of barium could be made out in the upper portion of the stomach which was probably in one of the ulcerated areas. Conclusions: Carcinoma involving three-fourths of the stomach.

In spite of the fact that this case involved so much of the stomach no metastasis could be demonstrated. That is, no rectal shelf, no enlarged glands, no nodules in the liver or umbilicus, no jaundice nor metastasis in the lung. Dr. O. H. Wangensteen did a total gastric resection in which the lower inch of the esophagus had to be removed. The end of the esophagus was anastomosed to the jejunum and an entero-anastomosis between the afferent and efferent loops of the jejunum was made. Fluids were started by mouth on the fifth day. He made an uneventful recovery and is now up and around and is eating a semi-solid diet without any discomfort.

It is interesting to speculate on what will happen to the part of the small bowel that was anastomosed to the esophagus. It is evident that the small bowel has a great power of dilatation and hypertrophy. This was evident in a case of multiple stenosis of the small bowel that was recently on our service. Pouch-like enlargements were noted all through the small bowel when a barium meal was given. These pouches simulated stomachs, in size and shape. We anticipate that part of the small bowel used in the anastomoses will dilate and become hypertrophied. Barium meal examination done March 10th showed a beginning dilatation of cone-like enlargement in this area. He has no diarrhea. There are one or two formed bowel movements daily.

So far surgery is the only salvation in this type of case, and it is only by the aggressive attitude that a few of these carcinomas of the stomach, usually called inoperable, have any chance whatever.

In the past I believe we have been prone to call a case inoperable on insufficient data. A

*From the Medical Service, University Hospital, Minneapolis. Presented before the Minnesota Society of Internal Medicine, Duluth, May 26, 1930.

pathologist[4] in London has made the observation that from 20 to 25 per cent of all cases of carcinoma in his series that died unoperated had no lymph node involvement and no metastases, therefore they were purely local growths. Surely it is more important to explore a few abdomens than to have such a large percentage in one series where gastric resection was not attempted. It is true that no one can state the time when metastasis occurs, but when one is unable to demonstrate any metastasis clinically or by roentgenological examination, the advisability of laparotomy should be considered. In some cases where laparotomy previously has been performed and the growth considered inoperable, a second exploration is not out of order if, when the patient comes under one's observation, there is no evidence of metastasis. This is especially true in cases where the previous operator had limited experience. This is illustrated in the following case.

Mrs. S., seventy-five years of age, complained of pain in the epigastrium, loss of weight, nausea without vomiting and loss of appetite. For approximately two years the patient had been having gastrointestinal symptoms. The pain in the epigastrium seemed to have no relation to meals and she found no medication that gave her relief. The type of food that she ate did not appear to affect the pain nor increase her nausea. She gradually lost weight, from 185 pounds to 148 pounds, most of this during the preceding three months. She went to a hospital in June, 1929, where an operation was performed. The surgeon stated that he could do nothing for her and closed the abdomen. Three months after the exploratory operation, September, 1929, she was admitted to the University Hospital, because of gradual increase of her symptoms.

Physical examination revealed nothing of note except in the midepigastrium where there was a small palpable tumor, rather indefinite in outline. Blood showed hemoglobin 51 per cent, red blood cells 2,800,000, white blood cells 8,600. The blood Wassermann reaction was negative. Occult blood was present in the stool on each examination. *X*-ray examination of the stomach and duodenum revealed a characteristic filling defect in the pyloric portion of the stomach just proximal to the pylorus. This extended up to the junction of the pyloric and the middle third of the stomach. The appearance suggested a scirrhous type of carcinoma, but there were several nodules projecting into the lumen of the stomach. The duodenal bulb showed considerable deformity, and there was also some deformity of the second portion of the duodenum. This might have been due to pressure or to perigastric and periduodenal adhesions. The diagnosis was: carcinoma of the stomach, pyloric end, probably operable. A second exploration was advised. Because of the condition of the blood, several transfusions were given before and one immediately following the operation. Partial gastric resection was done. The operation was performed on September 23, 1929, by Dr. W. T. Peyton. The patient is gaining weight, has relief from her original complaints and is doing her own housework. Gastrointestinal *x*-ray study the 20th of June, 1930, revealed a normally functioning gastric resection. No evidence of metastasis in any part of the body could be found.

It is evident in cases like the ones just cited that no thoughtful surgeon or internist would claim a definite cure. But both patients have been given the only existing chance and life has been prolonged. How soon, if at all, the cancer will recur no one can state, but by pursuing the attitude thus exemplified a number of patients will enjoy a long period of relief.

We have noticed that many of our cases of carcinoma of the stomach, where there is a definite palpable mass, turn out to be operable in spite of the size of the tumor. In other words, it often appears that large, palpable carcinomas are purely local growths.

In many cases where there are vague symptoms only and no mass is palpable, the diagnosis is difficult. In these cases we rely upon the *x*-ray and fluoroscopic examination for the early diagnosis. The most important information is obtained by means of the fluoroscopic observation and the *x*-ray films chiefly serve to fix the impression gained from the fluoroscopic examination. It is our opinion that all patients in the cancer age who have gastrointestinal symptoms should have a barium meal examination and this should be repeated from time to time as long as the gastro-intestinal symptoms go unrelieved. This is especially true in cases where occult blood is found in the stool. Any case that shows persistent occult blood in the stool and where no satisfactory explanation therefor can be found, we believe should be considered for an exploratory laparotomy. Sometimes the cause of occult bleeding from the gastrointestinal tract is very difficult to unravel, requiring detailed studies. Where there is an *x*-ray report of a suspicion of a cancer in the stomach and occult blood is present in the stool, there is definite indication for exploration.

When a patient has been carefully studied and a diagnosis such as chronic gallbladder disease has been made and the patient subjected to operation but when after the operation no diminution of the symptoms is noted, we are likely to try to get rid of such a case in any way possible. The importance of post-operative follow-up work constantly impresses itself upon us. Thus we

have learned how easily a cancer of the stomach might be overlooked. Time and again this point is brought home to everybody who tries to carry out a systematic follow-up work on his patients. Thus we are trying to use as a working hypothesis that every patient in the cancer age has a potential malignancy until otherwise proven. The case of Mrs. F. illustrates this.

A housewife, aged 45, was admitted to the University Dispensary, in June, 1925, complaining of pain in the abdomen which was constant and gnawing, especially in the right upper quadrant. The condition was made worse by greasy foods and coffee. By occasional vomiting, unrelated to meals, the patient obtained almost complete relief. Soda and other medications gave no relief. The symptoms were of two years duration. The patient was constipated most of the time.

Physical examination was essentially negative except for moderate tenderness over the right, upper quadrant. *X*-ray examination of the gall-bladder showed no evidence of filling. *X*-ray examination of the stomach and duodenum showed no abnormalities. Gastric expression showed free HCl. Hemoglobin 80 per cent, red blood cells 4,500,000, white blood cells 7,200. In August, 1926, the patient was referred to the University Hospital where an appendectomy and cholecystectomy were performed. The stomach and duodenum were reported negative on direct palpation during the operation. The gallbladder and appendix appeared normal, but were removed and the patient made an uneventful recovery. Five weeks after the operation all her original symptoms returned. In January, 1927, she returned to the University Dispensary for further study. This time she complained of frequent vomiting after meals. Her weight was 134 pounds. Her best weight had been 160 pounds. *X*-ray of the gastrointestinal tract showed no abnormalities.

In October, 1927, she re-entered the hospital and physical examination was negative. Her weight was 106 pounds. Blood: Hemoglobin 90 per cent, red blood cells 4,500,000 and white blood cells 5,100. Stool examination was positive for occult blood on one examination. Gastric expression showed no retention, a free HCl of 6 and a total acidity of 20. *X*-ray examination by Dr. L. Rigler showed a normal stomach in size, shape and position. There was, however, an area on the lesser curvature in the middle third of the stomach extending from the junction of the proximal and middle third down to the junction of the pyloric and middle third which showed definite infiltration, rigidity and absence of peristalsis. There was some spasticity on the greater curvature of the stomach opposite this infiltration. The meal passed through the stomach without hindrance and the remainder of the stomach appeared normal. There was some slight suggestion of ulceration in the region of the infiltrated area. Conclusion: carcinoma, middle third of the stomach, lesser curvature, scirrhous type. No metastasis could be demonstrated in the liver, lymph nodes or lungs. There was no rectal shelf nor was there at any time any jaundice. November 9, 1927, she was operated upon. The surgeon at first could find nothing and he wanted to close the abdomen, but the internist and the roentgenologist present at the operation insisted that the operator open the stomach and palpate the inside. This was done and he felt an infiltration in the area suggested by *x*-ray. Large lymph nodes on the greater curvature of the stomach were noted. The midportion of the lesser curvature of the stomach was occupied by an indefinite, indurated, thickened area. The size was approximately 2 cm. in diameter. The posterior wall of the stomach was adherent to the pancreas. A partial gastrectomy was performed. She made an uneventful recovery. The pathologist reported a small, firm, flat tumor of the lesser curvature of the stomach, 2 cm. in diameter, with edges slightly elevated. Microscopic examination showed thin infiltrating cords of epithelium resembling lymphoid cells and there was marked fibrosis. Diagnosis: scirrhous carcinoma.

Her symptoms did not recur and the patient gradually gained weight. Since her operation she has gained approximately forty pounds and has no gastric symptoms. At this time we are unable to demonstrate any metastasis or recurrence in the stomach.

In this connection it is probably fitting to cite another case where Dr. F. W. Bissell,[2] formerly roentgenologist of the University Hospital, made a diagnosis of early scirrhous carcinoma of the pyloric end of the stomach. An exploratory operation was performed but the surgeon claimed he could find no carcinoma. But, he did not open the stomach. Ten years later the patient died at the Ancker Hospital in St. Paul, and at necropsy a scirrhous carcinoma involving the entire stomach was found. This demonstrates a point successfully fought out years ago in regard to duodenal ulcer and equally true in regard to explorations for cancer of the stomach; namely, that an explorative laparotomy cannot be accepted as negative until the stomach has been palpated from the inside.

In this connection I wish to cite a case related by Dr. E. T. Bell,[1] chief of the Department of Pathology. A diagnosis of carcinoma of the stomach had been made and an exploratory operation performed. The surgeon found numerous large glands in the region of the stomach. He removed a few of them, but thinking that the carcinoma was inoperable because of the glands, no gastric resection was done. Section of the nodes showed a scirrhous carcinoma. The patient was practically symptom-free for two years, but after four years died from scirrhous carcinoma involving practically the entire stomach.

An interesting phase of the subject is being

studied by Dr. J. Sagel,[3] Fellow in the Roentgenological Department at our hospital. In a series of approximately fifty cases of carcinoma of the stomach that have been studied by the Roentgenological Department for the last ten months, approximately 75 per cent have seen a physician because of gastrointestinal symptoms six months to a year before they were referred to the Dispensary or had any gastrointestinal study. That means that the majority of cases in this series had seen their doctor early, had had a superficial examination and been given some prescription and usually a diet and told to report back in from two weeks to a month. The majority of these cases were in the so-called cancer age. It is significant that 5 per cent of the cases were examined behind the fluoroscopic screen by the local physician from two to four weeks previous to the admission to our hospital and told that the stomach and duodenum were normal. These facts are worthy of serious consideration from several points of view. For one thing they bring up the question of the value of fluoroscopic examinations of the gastrointestinal tract when done by the general practitioner who possesses an *x*-ray machine but who has had little special roentgenological training. It is a commonplace to state that every patient who is being subjected to the expense of *x*-ray examination is entitled to have the work done by a competent roentgenologist. Of course, to do a routine gastrointestinal *x*-ray study of all cases in the cancer age would mean a tremendous expenditure of time and money, and it is questionable whether it would be justified. In our hospital it is a routine procedure that all cases on the Medical Service and in the Dispensary have at least two stool samples studied especially for blood, pus and mucus. Whether there is gross blood present or not, a sample from the inside of the stool is examined for occult blood and if such is present the assumption that it comes from high up in the gastrointestinal tract often proves correct.. This simple procedure is an inexpensive check that might be correctly used as an indication for complete gastrointestinal study. In the last month in our hospital two cases of carcinoma of the stomach were discovered in this way.

Many private surgeons as well as hospitals have reported cures in carcinomas of the stomach of from five to ten years duration. Dr. Arnold Schwyzer of St. Paul has a unique series ranging from eight to twenty-four years of freedom from recurrence after removal of the cancer. He has in his experience six instances of cures lasting more than eight years. Three of them have been definitely proven to have had carcinoma. In the others the specimens have been lost.

Mr. B. was operated on by Dr. Schwyzer,[4] September, 1915. A large carcinoma involving two-thirds of the lesser curvature and one-half of the posterior wall was found. It was adherent to the liver. A large piece of the liver was removed with the mass. Microscopic examination revealed an adenocarcinoma. This patient is today living and well.

Many of his patients have had a gastrointestinal history lasting from three to five years before any operation was attempted, and it is surprising how many of them were favorable for resection. This is illustrated by the case of Mr. B., sixty-six years of age, who was operated on in April, 1915. His symptoms dated back three years and for one year he had severe pain, nausea and vomiting with a marked loss of weight. A radical resection of the stomach was made and the patient is still living at the age of 80. Dr. Schwyzer also has a patient that he operated on in 1905 and the specimen is in the Museum of the Department of Pathology, University of Minnesota. A partial gastric resection was done for a large carcinoma. At the time of the operation he was sixty years of age. He died last fall at the age of eighty-four. In other words he enjoyed twenty-four years of life that he could not have had if he had not been operated upon by an aggressive surgeon. Other cases are reported in literature similar to the above mentioned; enough to encourage us in our aggressive stand.

In the statistical approach to the study of carcinoma of the stomach one must not lose sight of the fact that although it gives some definite information concerning what has been done in the past with carcinoma of the stomach, it is evident that it tells nothing concerning what can be done. Statistical studies are important, but we must be careful concerning the interpretation of the results. It appears from this type of study as though the carcinomas were on the increase, but when one considers that more people are living to the cancer age, one has to defer the interpretation of the apparent increase and at present it is permissible to doubt that any real increase has taken place.

When one studies the favorable cases reported in the literature one is impressed with the fact that they are not the results of chance diagnoses, I mean not picked up without symptoms in the course of routine examination. In the majority of cases the diagnosis was due to thorough, persistent diagnostic work by those in charge. Most of the cases had symptoms referable to the gastrointestinal tract and through proper study and interpretation the right diagnosis was reached. Hence, the correct treatment was instigated. Of course in some cases metastases occur early. That is, there is an early breakdown in the lymph node barrier but there is the question whether these cases are not in the minority. Most of our cases that prove inoperable are so because of local infiltration into the surrounding tissues. If this is correct, it gives encouragement, for in this type timely diagnostic work should lead to decrease in mortality. This reminds me of a case referred to the University Hospital from a town not so far from the Mayo Clinic. I say this to show how close the doctor was to competent roentgenologists and yet he did not use them. The patient was a prominent man of forty-eight years of age who wanted good service. He went to the local doctor complaining of belching gas, food idiosyncrasies and distress in the upper part of his abdomen. The doctor treated him for ten months with a bland diet and powders. An examination of his stools was not made nor was the patient subjected to an *x*-ray examination, although he was close to one of the greatest medical centers in the world. At the end of ten months the patient became dissatisfied and came to the University Hospital, where a subsequent examination showed an inoperable carcinoma; inoperable, not because of metastasis in other parts of the body, but because of the extension and infiltration of the tumor into the surrounding tissues. If the unfavorable statistics reported are made up of many cases of this type there is a chance for a marked improvement. As the result of the propaganda which is being spread over the country educating the laity to go to the doctor early, the burden of the early diagnosis is being shifted to the medical profession. It is imperative that we take up the challenge so that the statistics in the future will not indict us for not having done our part.

In summarizing I might state that an attitude of pessimism has been associated with carcinoma of the stomach to an extent which, I believe, is detrimental. More emphasis should be placed on stool examinations. All patients in the cancer age that have gastric symptoms warrant a fluoroscopic and *x*-ray examination. An exploratory operation is indicated when a malignancy of the stomach is suggested and it is not complete until the stomach itself has been opened and palpated from the inside. A large carcinoma of the stomach is not necessarily inoperable; in fact some of the largest carcinomas have given the best results from operation. Sufficient instances of cure of carcinoma of the stomach over three, five, ten and even twenty year periods are found in the literature to justify a more optimistic attitude.

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AMBROSE PARÉ—MILITARY SURGEON

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"TREPAN the King!" cried the doctors with horror.

"And what is the nature of this operation?" asked the Duke de Guise.

"It is little known, monseigneur," said the surgeon. "It is an operation with an instrument invented by myself, and which I call a trepan, making on the top of head, or rather on the lateral part of the brain, an opening the width of an angelot."

"God of mercy!" cried Catherine de Medici indignantly, "Pierce the king's head! And you would have done it!"

"Yes, madame," replied Ambroise, simply.

Although the above lines of Dumas are taken from what is probably a purely imaginative account of the fatal illness of Francois II, it presents a very complete picture of Ambroise Paré, his professional and social contacts, scientific attainments, and his simple and unswerving adherence to the dictates of his medical conscience in a crisis. All about him ran rampant intrigue, plots, wickedness, lust for power, superstition, with poisonings, assassinations, and loss of heads commonplace events, yet anyone familiar with the character of the great Paré would know that in the face of so desperate a situation he would hew straight to the line, and if the king needed to be trephined, trephined he would be.

Born in Bourg Hersent, now part of the city of Laval, in the province of Maine about the year 1510, little did the cabinetmaker's son know, when he was first put out to board with the cleric, that he was to occupy an honored position as physician and friend to the royalty of France during one of the most glamorous periods in her history. Beginning his medical career in the early part of that century during which his country was to experience some of her most terrible days: civil, religious, and foreign wars; political and religious persecution; wicked extravagance and wanton waste; stark poverty, misery, and suffering; with the Field of The Cloth of Gold as one extreme and the salt tax as the other; he was destined to be confidant and medical adviser to many of the principals in the great drama.

Catherine de Medici, licentious, bigoted, crafty, the instigator of the Massacre of Saint Bartholomew; the terrible woman's three degenerate sons, Francois II, husband of Mary Queen of Scots, Charles II, weakling, under whose reign the wholesale slaughter of the Huguenots took place, and Henry II, who caused the murder of the Duke de Guise and his brother, the cardinal; Margaret of Angouleme, Queen of Navarre—the marrying and murdering daughter of the King of Scotland and Mary of Guise, whose schemes finally lost her her head; Diana de Poitiers, fascinating mistress of Henry II; Henry III, the thirteenth and last Valois king, whose family ruled for two hundred and sixty-one years; Admiral Coligny, the celebrated naval general and Huguenot leader; Rabelais, monk, doctor and humorist, whose ribald pen wreaked havoc with the evils of the time; Montaigne, the philosopher; Montmorency, the soldier; the entire family of Guises; and a host of others. What a calling list! What a practice! The fact that he continued to act in as confidential a capacity as that of physician to such a host until his eightieth year is the best testimonial as to his courage, sagacity, honesty, and technical skill that one could wish for.

Paré is known as the father of modern surgery, and since much of his wisdom and experience was gained through his duties with the armies on the various campaigns, he was essentially a military surgeon. As a boy, he was sent to live with an ecclesiastical gentleman for the purpose of learning Latin. Whether or not this was done with the idea of a medical career in mind we do not know, but at any rate, he acquired no knowledge of Latin, the pious one keeping him busy with other tasks than those leading to a classical education. Soon we find him apprenticed to a barber-surgeon, who taught him bleeding, cupping, leeching, and such other duties of his calling that he deemed essential. The barber-surgeon, Laval, was unable to teach him the Latin so necessary to the surgeon of the day, and this failing, which he never corrected, was to bring upon him much adverse criticism and ridicule

by his confreres in later years. He remained for some time with this master, and then, through what influence is not known, became a *compagnon chirurgien,* a sort of interne or resident physician at the Hotel Dieu. This was the only public hospital in Paris, having been founded in the seventh century, and although under the management of the Canon of Notre Dame at the time of his stay there, became the battle ground for the then frequent altercations among the various classes of the medical profession.

In France during the early part of the sixteenth century the practitioners of medicine were divided into three groups: the physicians, the surgeons, and the barber-surgeons. The first class belonged to the Faculte de Medicine, and exercised an autocratic supervision over all who practiced the art; the surgeons, members of the Confrerie de Saint Come, wore long robes, and deigned to treat surgical conditions by means of ointments, plasters, and cauterizing agents only, and would not stoop to perform operations; the barber-surgeons did venesection and cupping. Each group encroached on the fields of the other groups, all were jealous, and the rowing and bickering was furious and continuous.

An old work enumerates the following table of the practitioners of medicine, possibly a short time later than the early sixteen hundreds, and probably including Germany as well as France, but for the purpose of illustration, gives a good picture of the chaos that existed at the time.

I. Medical practitioners proper.
   a. Medici in general, commissioned, court, field, hospital, and plague medici.
   b. Surgeons, barbers, regimental surgeons, oculists, herniotomists, lithotomists, bath-keepers.
   c. Superior sworn midwives, ordinary midwives, inferior midwives, nurses.

II. Sundry impostors and pretended physicians. Old Women, village priests, hermits, quacks, uroscopists, Pseudo-Paracelcists, pyrotechnists, Jews, calf-doctors (emetic-peddlers), executioners, crystal romancers, mountebanks, vagrants, magicians, exorcists, monsters, wood-hermits, rat-catchers, bankrupts, jugglers, gipsies, professors, veterinary physicians, and (*sic*) etc.

After three or four years at the Hotel Dieu, a period concerning which we have meager information, he left, and about the year 1536, began his military career as a surgeon with troops. At this time Anne de Montmorency led the French army away on a campaign in which they followed the retreating forces of Charles V across the Alps, finally ending up in Turin, where a considerable time was passed. Paré acted as surgeon to Mareschal de Montjan, a position he held for two years until the death of his chief, when he returned to Paris. During this campaign his duties were many and arduous. If the army surgeon of today imagines that his task is a difficult one, let him glance at the order given the field surgeon of Paré's time. In addition to superstition, ignorance, sorcery, Black Magic, etc., he had to contend with a dismal lack of knowledge of anatomy, psysiology, and pathology as we know them today. Wounds almost invariably became horribly infected with the result that amputations were universally done in cases where today such a procedure would be entirely unnecessary. The following is a short list of the ordinance used to keep the surgeon busy. "There we found," says Ambroise, in his "Apology and Treatise," "everyone in arms, tocsin sounding from all sides, yea, for five or six leagues about the harbors, to wit, Brest, Couquet, Crozon, le Fou, Doulac, Laudenac, each well-furnished with artillery such as cannon, demi-cannon, bastards, posse-volants, field-pieces, culverines, serpentines, basilisks, sakers, falcons, falconneaux, flutes, orgues, arquebuses a croc, ..." Add to this imposing arsenal such toys as halberds, pikes, axes, javelins, swords, daggers, clubs, bars of iron, chains, grenades, lances, torches, fusees, melted lead, and quick-lime (to put out eyes) and it is small wonder that the good Paré frequently had his ingenuity tested to the point of entirely novel therapeutic measures.

It was in this his first campaign that he cast aside the time-honored custom of cauterizing wounds made with firearms. According to tradition and because gunpowder wounds "participate of venomosity" they must be treated with boiling oil, notwithstanding the

attendant pain and bitter objections on the part of the patients. So great was the carnage in the battle about the Chateau de Villane that the supplies of the young surgeon became exhausted and he presently found himself with many wounds still to be treated and no oil remaining. Necessity mothering invention, he conceived a dressing of egg-yolk, oil of roses, and turpentine. During the night he became so worried concerning the wounds he had dressed in so radical a manner that sleep was impossible, and after tossing about all night, he arose at dawn to inspect his wounded. He was overjoyed to discover that those which had been treated with the new ointment were quite comfortable, while the wounds of those burned with the hot oil were feverish and swollen, and the unfortunate victims writhing and groaning in pain. "Then," he writes, "I resolved with myself never more to burn thus cruelly men wounded with gunshot."

Although humble enough at times (one of his favorite expressions being *"Je le pansai, Dieu le guérit"*) he is Cellini-like enough at others. In apology for the latter characteristic it might be suggested, however, that with the jealousies and obstructions he was forced to combat among his confreres, a shrinking nature most certainly would have got him nowhere. He remarks of the soldiers fighting among themselves and modestly says, "If there were four wounded I always had three of them, and if it was a question of cutting off an arm or a leg, or to trepan, or to reduce a fracture or a dislocation, I brought it well to an end." In consultation, if there was any serious piece of surgery to do, he was always the one chosen to do it, and he always did it "promptly and dextrously, and with great assurance," so that the other surgeons wondered at such skill in one so young.

As has been said, parts were lopped off ruthlessly, and by no means always unnecessarily, since the prevalence of infection in traumatized wounds often meant a fatal termination, whereas a more or less cleanly made amputation gave the patient at least an even chance. Tradition dictated that all amputation wounds be seared with white-hot irons, and a set of cauteries were a regular part of the military surgeon's armamentarium. Paré had for some time been mulling over the idea of supplanting the cautery with the ligature as a means of controlling hemorrhage after amputations. In fact he had discussed it some time earlier with two confreres who agreed that it might be safely attempted. In 1552 he amputated an officers' leg, and instead of using the hot irons to close the great vessels, he tied them securely with ligatures. He writes about his patient, "He returned home gaily with a wooden leg, saying that he had got off cheaply without being miserably burned to stop the bleeding." This innovation was to bring about countless arguments and objections from the conservatives, and it was years before the practice became generally accepted.

In 1554, at the age of forty-four, he was made a member of the College of Saint Come, and being no longer a barber-surgeon, was allowed to wear the long robe which was the surgeon's distinguishing mark. It was no secret that he was ignorant of Latin. In fact he voiced loud defies to the effect that the French tongue was good enough for anybody to speak or write. His inability to use the language of the surgeons was more than offset by his now recognized technical ability and experience, and also, what was by no means a trivial consideration, his influence with the nobility, so that it was considered expedient to admit him by means of an examination in Latin that even he could pass. After having spent the better part of fifteen years campaigning, he now set himself to work studying anatomy and rewriting one of his books, in which manner he passed the ensuing three or four years.

In 1559 he was saddened by the death of his king and friend, Henry II, also dramatically and incidentally incorrectly described by Dumas. The king, riding in a tournament and wearing the colors of the beautiful Madame de Poitiers was laid low by a blow over the right eye with a lance in the hands of Gabriel de Montgomery. Although Dumas has it that Paré was at Peronne and was not called to attend his majesty, it is a fact that both he and Vesalius were among the surgeons who were with him in his last days. Though numerous consultations were held, the splinters of the lance could not be located, even after the surgeons experimented with the heads of

four recently beheaded criminals, driving lances into the skulls in an effort to determine the direction taken by the fragments. The king died on the eleventh day and in his works Paré describes very accurately the postmortem findings in the royal brain.

Throughout his long lifetime he was constantly observant and always eager to avail himself of every opportunity to utilize a new idea in his art. He relentlessly pursued another surgeon who was purported to have a formula for a very excellent ointment to be used as a wound dressing. It was only after two years of pestering that he finally persuaded the other to relinquish his secret, and when Paré did obtain the prescription, it was found to contain several ingredients, among which was boiled new-born puppies. To his credit is the improvement in the technic of amputations, and the use of the ligature as a substitute for the cautery. His ointment for gunshot wounds instead of boiling oil was one of the first steps in the rational treatment of those injuries. Malgaigne believes him to be the first to make mention of metastatic abscesses in the various organs following wound infection. He popularized the truss for hernia, and made the first disarticulation of the elbow-joint. In obstetrics he described podalic version, and induced labor in cases of uterine hemorrhage; he devised various appliances and procedures improving the practice of dentistry. An operation for cataract is given, but his link with the past is shown by the statement that it should only be performed at the waning of the moon. He was responsible for many advances in the art of medicine, swept away many superstitions, and popularized many valuable procedures.

His treatise on the mummy and the unicorn is an indication of the popular state of mind. Mummy was a resinous substance supposed to be obtained only from Egyptian mummies. Unicorns horn was extremely costly since it was considered an absolute preventative against poisoning, a piece of it dipped into any decoction rendering the drink harmless. Genuine unicorns horn commanded a fabulous price. Paré cast a bombshell into the camps of the entire medical fraternity when he declared that there was no proof that such an animal as an unicorn ever existed, and if such did, the horn was of no value.

His works include among others a treatise on gunshot wounds published in 1545; a work on podalic version in 1550; Wounds of the Head, and Anatomie Universelle in 1561; and a treatise on surgery published in 1564. Following epidemics he wrote in 1568 a set of works on plague, small-pox, and measles, and in 1573 in addition to two more works on surgery, his famous book dealing with "Monsters, Terrestial and Marine." In 1582 came the death blow to the charm-merchants in his work on mummy and unicorn's horn.

Francis Packard speaks of Paré as "one whose fame as a human benefactor will last until the race is no more, who from the humblest origin rose to high station solely as the result of his own genius . . . . his kindly, genial nature, coupled with his good sense . . . . a Frenchman writing scientific works with logical incisiveness and art . . . . his benevolence and charity to common soldiers. L'Estoile writes of him, "Thursday, twentieth of December, 1590, the Eve of Saint Thomas, died at Paris, in his own house, Master Ambroise Paré, surgeon to the king, aged eighty years, a learned man and the chief of his art; who, in spite of the times, had always talked and talked freely for peace and for the good of the people, that which made him as much loved by the good as he was wished evil and hated by the wicked."

HYPERTHYROIDISM*

A REVIEW OF 270 HOSPITAL RECORDS

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BETWEEN the dates of January 1, 1924, and January 1, 1930, 270 cases of hyperthyroidism were treated in the New Asbury Hospital, Minneapolis. Of this number 224 were treated surgically: 213 by thyroidectomy; 10 by ligations without subsequent thyroidectomies in this hospital; 1 by drainage of an abscess involving an adenoma.

Sex.—There was a marked predominance of females (83 per cent) over the males (17 per cent).

Age.—The ages of the males ranged from 18 to 64. Those of the females ranged from 11 to 93. The four oldest were 93, 72, 70 and 70. Fifty-three per cent of females were between 20 and 40 years. The following is a table of age distribution:

Age	Male	Per Cent	Female	Per Cent
11-20	3	6	4	2
20-30	10	23	60	27
31-40	16	35	58	26
41-50	4	8	35	16
51-60	11	24	46	20
61-70	2	4	19	8
71-93	0	....	2	1

The average age of the females was 39.4 years; of the males, 38.8 years.

Symptoms.—The following is a survey of the frequency of subjective symptoms. The most constant symptoms were: nervousness, palpitation, and loss of weight. It is to be noted that a tumor mass or enlargement of the neck was complained of in only one-third of the cases, but was palpable in 75 per cent.

	Per Cent
Nervousness	81
Palpitation	75
Loss of weight	48
Fatigue and weakness	27
Excessive perspiration	21
Tremor or unsteadiness	16
Increased appetite	15
Dyspnea	14
Abdominal cramps	12
Choking sensations	8
Edema of feet and ankles	7
Cough	6
Sensations of heat waves	6
Decreased appetite	5
Nausea, with or without emesis	5
Diarrhea, periodic	5
Decreased menstrual flow	3
Insomnia	3
Mania	2
Epistaxis	2
Generalized pruritis	2
Headaches	2

Other complaints appearing only once were: backache, swollen lids, dizziness, diplopia.

Physical Findings.—Order of frequency of physical findings was as follows:

	Per Cent
Palpable enlargement of thyroid	75
Tremors	70
Heart murmur	35
Exophthalmos	28
Lid lag	13
Nystagmus	10
Increased reflexes	10

Pulse pressure was generally high. The diastolic readings remained about normal, while the systolic were consistently higher than the usual findings. The average systolic blood pressure on entrance was 146, and the average diastolic was 76, giving an average pulse pressure of 70. The highest blood pressure, both in systolic and diastolic was 214/110 in a female of sixty years. In no case was the systolic reading below 100.

The average body weight among the males was 140 pounds, and among the females 122 pounds. The lowest weight of the males was 115 pounds, and of the females was 70, the latter in a woman of 37 years. The highest weight of this group of patients was 215 pounds in a female. Twelve per cent of the females were below 100 pounds.

Pre-Operative Treatment.—In reviewing the

*Presented May 1, 1930, before the Minneapolis Surgical Society by invitation after having been granted second prize in the Surgical Society Essay Contest.

†Formerly interne at the New Asbury Hospital, Minneapolis.

pre-operative treatment of these cases six (2.5 per cent) were found to have had previous operative procedures for hyperthyroidism; five had had thyroidectomies one to four years previously; one had had a ligation fifteen years before.

The medical preparation for surgery was limited to the use of only a few forms of medication:

Eighty-five per cent were given Lugol's solution—10-20 m. t.i.d.

Twenty-three per cent were given Luminal—grs. 1 to 1.5 in the evening.

Twenty per cent were given bromides, usually as triple bromides, and in dosage of grs. 15, t.i.d. or q.i.d.

Thirteen per cent were given some form of digitalis.

Bed rest was given to all those prepared in the hospital and to many who were prepared in the home. The average time for pre-operative preparation was two to three weeks. Some few cases received no formal preparation, but I noted that in nearly all of this group the symptoms were not intense, and also observed that where studies were made by the pathologist that the report was usually adenoma.

In preparation of those patients with the very highest basal metabolic readings, the following combination of rest and medication for two to three weeks seemed to be the most common:

Lugol's .....t.i.d.
Luminal..... ..... in the evening
Triple Bromides.....t.i.d.
Bed Rest.

One patient was given the Crile method preceding a double ligation.

Basal Metabolic Rates.—The highest reading of this series was so high that the patient was in the hospital and under the above treatment for one week before it was low enough to be registered on the graph, and then it was 128 (plus). No later record was available, but a thyroidectomy was accomplished and the patient made a good recovery.

The next highest rate was plus 98. This was reduced to a plus 45 in three weeks of this treatment. The two next highest were plus 95 each, one being reduced to plus 42 in three weeks and the other to a plus 45 in two and one-half weeks. Another of plus 93 was reduced to plus 55 in two and one-half weeks, without the bromides.

Examples of less extreme readings are:

Rate of plus 66 reduced to plus 22 in two weeks;
Rate of plus 44 reduced to plus 19 in two weeks, no bromides;
Rate of plus 50 reduced to plus 19 in two and one-half weeks, no bromides;
Rate of plus 39 reduced to plus 12 in two weeks, no bromides or luminal.

Many charts had as high as four basal metabolic readings during the pre-operative records. Some charts had only one basal reading, and a few had none, but these latter comprised a small enough group so as not to interfere with averages.

Seventy-five per cent of the basal metabolic rates went down under this treatment.

Twenty-five per cent either increased slightly or did not change.

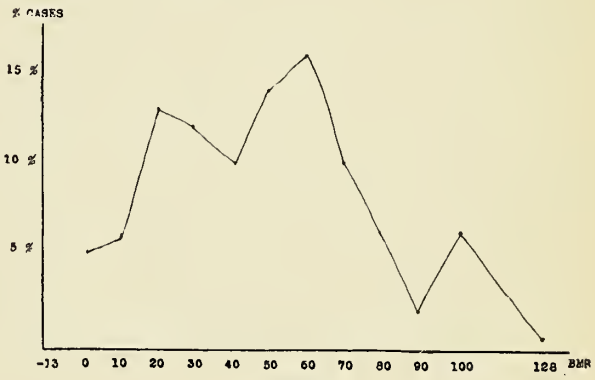


Figure 1.

Figure 1 is a graph of the distribution of the basal rates. The lowest was a minus 13, but this and other cases of minus rates were showing clinical symptoms of hyperthyroidism.

Post-Operative Treatment. — Post-operative treatment was very similar in type to the pre-operative:

Seventy-three per cent received Lugol's; 15 per cent were given luminal; 12 per cent were given some form of digitalis.

Otherwise the care was as is found in any group of post-operative cases. Glucose by rectum was given frequently. Patients remained in sitting posture three to five days. The treatment, postoperative, could not be traced for longer than the hospital stay, so cannot be reviewed completely. Most of the uncomplicated cases remained in the hospital seven to ten days following operation.

Complications.—The complications may be divided into a very few groups. About 9 per cent of the patients had cardiac complications following operation. Fibrillation was most common and in some cases there was no other finding than an exaggerated tachycardia, causing the patient fear and discomfort. The next most frequent group of complications was respiratory infections. Bronchitis was the most frequent, coryza next, and one case was recorded as broncho-pneumonia. These respiratory infections occurred in 5 per cent of the cases, one-fourth following local anesthesia, and three-fourths after general anesthesia. An infected wound was present in 3 per cent of the cases. In two instances the patient had been under treatment for diabetes for some time preceding thyroidectomy. No ill effects were noted after operation that could be attributed to the diabetes, these patients being under careful insulin management continuously by experts in care of diabetes.

Anesthesia.—The following is a calculation of the frequency of the use of the various anesthetics: 27 per cent novocaine plus nitrous oxide; 29 per cent nitrous oxide, or nitrous oxide plus ether; 44 per cent novocaine.

Post-Operative Condition.—No post-operative check on the condition of the patients could be made later than the date of leaving the hospital. Basal rates taken after operation were not available. However, the condition of the pulse and respiratory rates at the time of discharge from the hospital were as follows:

Seventy-four per cent showed moderate to marked lowering of pulse and respiratory rates; 19 per cent showed little change; 7 per cent showed a slight increase; none were marked.

The general condition of all seemed improved with the exception of two cases.

Pathology.—Studies and reports, either gross or microscopic, or both, were made by the pathologist in 74 per cent of thyroidectomy cases. Only one record of malignancy was found and this was reported to be open to question.

Personnel.—The work on this group of cases was done by sixty-one physicians, both medical and surgical. Of the operated cases, one-half was done by nine members of the staff, and the other half was divided among forty members.

Mortality.—Out of the 224 operative cases there were five deaths, a post-operative mortality rate of 2.3 per cent. In addition, two patients died without thyroid surgery. One who had marked hyperthyroid symptoms died following a cholecystostomy. The other entered the hospital in a toxic state and died the same day, autopsy showing cirrhosis of the liver and adenoma of the thyroid. Of the thyroid post-operative deaths, one was a male and four were females.

A brief review of the five fatal cases follows:

Case 1.—Female, age not given, weight 95 pounds.

Symptoms—Extreme nervousness for one year; palpitation and nausea, 3 months; very poor appetite.

Physical Findings—Lid lag, small mass in neck, tremor, tachycardia (108), poor tissue turgor. No. B.M.R. record.

Pre-operative Treatment—Digifolin, Lugol's (uncertain time).

Operation—Thyroidectomy.

Post-operative Treatment—Digifolin, Lugol's, intravenous saline, proctoclysis.

Complication—Auricular fibrillation. Death fifth post-operative day. No autopsy.

Case 2.—Female, aged 38, weight 215 pounds.

Symptoms—Nervousness, insomnia, weakness, excessive perspiration, and extremely active appetite for one year. Palpitation for five years. Palpitation started when patient took thyroid to reduce.

Physical Findings—Small mass in neck, tremor, obesity. Blood pressure 160/90. B.M.R. plus 43 on entrance, and after two weeks' treatment plus 25.

Pre-operative Treatment—Lugol's m X t.i.d., luminal at night.

Operation—Thyroidectomy.

Complication—Died within few hours after operation; extreme tachycardia, shock, hemorrhage into wound, and collapse of trachea. No autopsy.

Case 3.—Female, age 31.

Symptoms—Palpitation, loss of weight, visual disturbances, markedly increased appetite, and edema of the feet and ankles.

Physcial Findings—Exophthalmos, lid lag, nervousness, B.M.R. plus 20.

Pre-operative Treatment—Lugol's m X t.i.d., luminal at night, triple bromides t.i.d. Eight days' preparation.

Operation—Thyroidectomy started, but just as muscles were separated and the right upper pole grasped, the patient breathed strangely and died.

Autopsy—Air embolism (massive collapse of the lungs secondary to artificial respiration).

Case 4.—Female, age 42.

Symptoms—Dyspnea for four months, palpitation and nervousness for three months, vomiting for one week, with loss of weight.

Physical Findings—Mass in neck, exophthalmos. B.M.R. plus 77.

Pre-operative Treatment—Patient had taken Lugol's continuously for six weeks before entrance to hospital. After entering she was treated with bed rest, triple bromides, morphine sulphate, and hyoscine for seventeen days. Patient became steadily worse, and was

finally taken to operating room in semi-conscious condition.

Operation—Double ligation.

Complication—Died first day in apparent collapse. No autopsy. Toxic myocardium.

Case 5.—Male, age 64, weight 125 pounds.

Symptoms—Nervousness, palpitation, increased appetite two years.

Physical Findings—Exophthalmos, mass in neck, B.M.R. plus 41, and after two weeks' treatment increased to 52.

Pre-operative Treatment—Lugol's, luminal.

Operation—Thyroidectomy.

Complication—Died first day in shock. No autopsy.

SUMMARY

In reviewing this series of 270 hyperthyroid cases, treated in a private hospital by 60 members of the staff, it was found that 75 per cent responded by reduction of basal metabolic rate, to a treatment consisting chiefly of Lugol's solution, luminal at night, and triple bromides, this being given over a period of two to three weeks. Females predominated very markedly in number, individual weights were somewhat low, and systolic blood pressure somewhat high.

A remarkable standardization of treatment is shown with excellent results. The mortality under surgical treatment of 2.3 per cent under the conditions described in this paper, demonstrates the progress made in the treatment of this once dreaded disease.

DESICCATED OVARIAN PREPARATIONS FOR ORAL ADMINISTRATION OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that, believing that the available evidence fails to prove the therapeutic value of desiccated ovarian preparations composed of all or a part of the ovary for administration by mouth, it decided to omit all such preparations with the close of 1929 unless new evidence should meanwhile develop making other action justifiable. No acceptable evidence for the value of desiccated ovarian preparations for oral administration having become available, the Council confirmed its decision and omitted all desiccated ovary preparations for oral administration from New and Non-official Remedies, 1930. (Jour. A. M. A., June 21, 1930, p. 1997.)

GOLD SODIUM THIOSULPHATE IN LUPUS ERYTHEMATOSUS

Gold salts have provided an effective method of treating lupus erythematosus. The treatment usually definitely improves the condition and often gets entirely rid of it. Gold sodium thiosulphate is the salt generally used in the United States. The initial dose is 10 mg. dissolved in 2 c.c. of sterile distilled water, given intravenously. If this is well tolerated, the second dose is 25 mg. given from five to seven days later. After this the dose is repeated at weekly intervals. Doses up to 50 mg. may be administered and they have been as satisfactory as doses of 100 mg. Occasionally severe reactions result from the use of the drug. The drug should not be pushed when symptoms occur from it. (Jour. A. M. A., May 24, 1930, p. 1715.)

President's Letter

For reasons not difficult to understand, expert medical testimony as adduced in our courts is looked upon with considerable contempt by the laity, and with a feeling of exasperation by the medical profession. The legal profession appears to be quite complacent in regard to it, evidently considering the present methods of its application quite suitable to their needs.

Regardless of how medical testimony may be considered in general, the phase dealing with crime and insanity in particular appears to have aroused the greatest criticism on the part of the public and of the medical profession.

The Committee on Medico-Legal Affairs of the State Association made a careful study of this subject during the past year. An excerpt from its report to the House of Delegates follows:

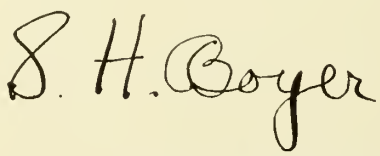
"It has been the belief of the Committee on Medico-Legal Affairs that the time is ripe in the state of Minnesota for some constructive legislation along the lines of expert testimony, particularly with reference to the mental status of criminals being brought to trial. It has been felt desirable to have the initiation of such legislation as in the state of Massachusetts, whereby the matter of the sanity of criminals is not brought before a jury for decision, but is determined by a commission or board appointed for that purpose, and that the matter of the sanity of the criminal should never be left to a lay jury to determine. In view of the fact that this involves an amendment to the constitution of the state of Minnesota, it is impossible to make any rapid progress in the enactment of such legislation. It is felt by this committee that such legislation should primarily be enacted through the legal profession, with the moral support of the medical profession of the state."

Whether or not the legal profession will become actively interested in such constructive legislation cannot be stated at the present time. In our opinion it is a duty incumbent upon them. The dictates of reason would suggest that *no* technical question should be decided by a lay jury.

The purpose of courts of justice is to learn and establish the truth. Judges and attorneys at the bar are, after all, merely instruments of legal interpretation and procedure, just as we of the medical profession are but instruments of healing. They are not expected to possess more than general knowledge on subjects outside of their special field of activity. The work of lawyers consists, in part at least, in gathering supposedly reliable information for presentation in court. Therein rests the reason for the expert witness. The latter is presumably accurately and scientifically informed in his particular field of training, whatever it may be. He is therefore called upon for the purpose of *enlightening the court* in regard to matters concerning which he has special knowledge and for the purpose of expressing an opinion based upon such knowledge.

Such being the fact it would seem that medical witnesses themselves could do a great deal toward improving the status of the medical expert. The spirit of scientific accuracy with its totally impersonal attitude should be cultivated. There are increasing instances in which the doctors called upon opposite sides of trial cases quietly get together and freely discuss the medical phases entering into such cases. Their attitude toward each other is one of candor and confidence. Their attitude toward the case in court becomes impersonal and unbiased. Their discussion is scientific and analytical. Such expert medical witnesses are interested not at all in one side or the other. They care not an iota which lawyer wins. They are vitally interested in arriving at a common and rational conclusion. Having reached a reasonable understanding they are prepared to appear on the witness stand and submit information and opinions which are truthful and not in conflict. As the purpose of such *ex cathedra* discussions is to advance honesty and truth it is impossible to see wherein any court could offer objection. Conceivably opposing counsel might not be so favorably disposed.

Manifestly the success of such conferences depends upon the complete trust and confidence of the conferees in each other. Happily, as the medical profession advances in knowledge, widens its field of contacts and takes on an increasingly broader outlook upon life, its members develop a greater respect for each other's attainments and integrity.



President,
Minnesota State Medical Association.

EDITORIAL

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BOEHLER'S METHOD OF TREATMENT OF FRACTURES

At the meeting of the Minnesota State Medical Association, in Duluth, Dr. Lorenz Boehler, of Vienna, gave a presentation of his treatment of fractures as conducted at his clinic. The large attendance at his lecture was evidence of the general practitioner's desire for more information on the subject. Owing to the fact that machinery, with all its hazards, is used on the farms so much more than formerly, and that modern highways, with rapid transportation, increase hazards, the staffs of hospitals in rural communities are called on to treat increasing numbers of types of fractures that formerly were seen chiefly in the industrial centers.

The establishment of Doctor Boehler's fracture clinic was brought about through his conviction that fractures demand special treatment and, therefore, that carefully planned and selected equipment is essential. By emphasizing the economic importance of the patient with a fracture he was able to induce certain insurance companies to establish the clinic solely for the treatment of fractures.

Because Doctor Boehler's methods are ingenious and unusual, the underlying principles may not be generally grasped. Traction is the keynote of his treatment, and is made possible by inserting rustless steel pins through the fragments and thus providing skeletal traction. The fracture is reduced, and while the position of the fragments is maintained, a split plaster-of Paris cast is applied and the pins are locked in its substance. Elevation of the part prevents subsequent swelling, which, if allowed to occur, would necessitate removal of the cast and loss of position. Local anesthesia simplifies reduction in certain types of fracture, and early use of the part prevents the necessity of a prolonged course of treatment with physical therapy, after union is obtained.

Briefly, Doctor Boehler's method consists of reduction by skeletal traction, elevation of the extremity to prevent swelling, and early motion of the parts involved.

M. S. H.

COOPERATION WITH THE PURPLE CROSS

It may or may not be appropriate that entrance to this world should be certified by the physician and exodus by the undertaker. It is not generally known, however, that according to the law in this state the undertaker is required to furnish a death certificate filled out and signed by the last physician in attendance, before a burial permit is allowed. This law went into effect several years ago and there might be room for argument whether the entire responsibility for certification should in justice be placed on

the undertaker. The law being as it is, there is every reason why the physician should cooperate in every way in filling out his part of the certificate. We are informed that 95 per cent of physicians promptly do their part. There are, of course, exceptions. One physician, we are informed, refused to be bothered because it was Sunday. This necessitated a second trip on the part of the undertaker, and, of course, caused inconvenience and hard feeling. It is almost inconceivable that any physician should have taken such an attitude.

The Purple Cross is the insignia adopted at the time of the World War by the funeral directors of the country, more commonly known as undertakers. Various localities, including Minneapolis and Saint Paul, have a Purple Cross Club composed of the local funeral directors.

The attention of officials of the State Medical Association has been called to this joint obligation of undertaker and physician, with the idea that better understanding will result. Both professions serve the public and it is in the interests of better service that attention is called to the need for 100 per cent cooperation.

MEDICAL MEETINGS

That the medical profession of Minnesota is alive is evidenced by the unusual opportunities recently afforded and about to be offered to physicians in the state. The A. M. A. meeting in Minneapolis in June, 1928, the Congress of the College of Physicians in the same city last February, and the Kidney Symposium at the University last July, are all fresh in our minds.

At a time when we were feeling considerable depression over the loss of three of our outstanding professors at the medical school, Drs. Schlutz, Adair and Scammon, along came the Kidney Symposium, a stupendous undertaking involving the assembling of world authorities on the kidney, conceived and accomplished by the energy of Professor Berglund.

In spite of the almost intolerable hot spell which outlasted the symposium, the meetings were well attended. Besides the many visitors, a number of local physicians attended the majority of sessions, and many returned frequently for another taste of what was for them a rather rich diet.

The first week of the two-week session was devoted to addresses and round table discussions of fundamental phases of kidney study—the growth, development and function of kidney structures. This was contributed to by such men as Drs. Carlson of Chicago, Haber of Michigan, Marshall of Johns Hopkins, Richards of Pennsylvania, White of Saint Louis, Scammon, Jackson and Bieter of Minnesota. Functional phases of the kidney were presented by Drs. Hannon, Rockefeller Institute, Rehberg of Copenhagen, Magath and Rowntree of Rochester, and Diehl, McKinlay and Bieter of Minnesota. Drs. Robinson of Sprague Memorial, Seeter of Hastings, Barker of Chicago and Berglund of Minnesota discussed the subject of blood proteins, chlorides and water balance. Dr. Bell of Minnesota, who has directed so much of his attention to kidney pathology, gave his well known views.

The second week of the symposium was spent in discussing pathological aspects of the kidney and treatment. This phase of the subject was contributed largely by Drs. Volhard of Frankford-on-the-Main, Snapper of Amsterdam, Longcope of Johns Hopkins and Fahr of the University. Eye background changes were presented by Drs. Foshberg, Friedenwald and Wagner. The question of whether nephrosis is or is not was not finally settled, but Epstein's views were listened to attentively.

And now comes the Inter-State Assembly to Minneapolis in October. The organization originated in this section of the country as the Tri-State Medical Association, but has rapidly grown in size and national importance until attendance has rivaled that at the A. M. A. meetings. Its activities have been and should continue to be strictly devoted to post-graduate education, the program being for the most part contributed by professors or associate professors of medical schools in the United States, Canada and abroad. Members of the profession of national and international reputation will contribute to the lengthy and interesting program to be offered. This opportunity should not be missed.

COFFEY-HUMBER METHOD FOR CANCER

The remarkable publicity accompanying the introduction of the Coffey-Humber method for the treatment of cancer passed briefly into a quiet phase, leaped upward with the eastward jaunt to the congressional hearing, again became quiescent for a few weeks, and burst forth into a Sunday supplement feature. In the meantime pathologists, surgeons and other cognoscenti who have investigated the method express nothing but profound disappointment with both the clinical and the pathologic results. (Jour. A. M. A., May 3, 1930, p. 1410.)

OF GENERAL INTEREST

Dr. G. D. Guilbert, formerly of waterville, is now located at Maynard, Minnesota.

Dr. L. F. Woodworth, of Le Sueur Center, is taking post-graduate work at Iowa University.

Dr. Edward Gibbs has recently become associated in practice with Dr. Charles N. Hensel of Saint Paul.

Dr. W. C. Ehmke, of Willow River, has returned to his practice following a vacation trip in Southern Minnesota.

Dr. J. J. Kolars, of Le Sueur Center, is taking a course at the Post-Graduate School of Surgical Technique, Chicago.

Dr. C. R. Christenson, formerly of Starbuck, Minnesota, opened offices at 404-406 Wilmac Building, Minneapolis, July 1.

John A. Cameron, Jr., son of Dr. John A. Cameron, Saint Paul, died August 18, 1930, following an automobile accident the previous day.

Dr. H. K. Helseth is practicing at Appleton, Minnesota, where he located following a year's interneship at St. Barnabas Hospital, Minneapolis.

Dr. Eugene Edward Scott has opened an office at 814 Lowry Medical Arts Building, Saint Paul, for the practice of general surgery and proctology.

Dr. R. Wayne Esperson has established a practice in Bend, Oregon, following the completion of his interneship at the Miller Hospital, Saint Paul.

Dr. Valorus F. Lang, of Minneapolis, after completing his interneship at Ancker Hospital, Saint Paul, is taking a fellowship at the Mayo Foundation.

Dr. Elmer Wahlberg is engaged in general practice at Isle, Minnesota. Dr. Wahlberg completed his interneship this year at the Miller Hospital, Saint Paul.

Dr. Elmer A. Smisek is now associated in practice with Dr. Thomas Gratzek of Saint Paul. Dr. Smisek completed his interneship at the Miller Hospital this spring.

Dr. A. F. Hunte, formerly of Truman, Minnesota, is now located at the San Carlos Indian Agency, Rice, Arizona, where he has accepted an appointment as physician.

Dr. Marland Williams, after completing his internship at Bethesda Hospital, Saint Paul, has taken over the practice of the late Dr. Connolly at Cannon Falls, Minnesota.

Dr. Lee R. Alderson, Rochester, after serving his interneship in the Indiana University Hospital last year, is now majoring in pediatrics at the Mayo Foundation, Rochester.

Dr. Raymond B. Allen, Minneapolis, has severed his connection with the Northwest Clinic of Minot, North Dakota, and is majoring in urology at the Mayo Foundation, Rochester.

Dr. John R. Meade, Saint Paul, is taking a post-graduate fellowship in the Mayo Foundation, Rochester, having served the past year as interne at St. Joseph's Hospital, Saint Paul.

Dr. Leslie L. Nunn has opened offices at 521 Arts Building, Vancouver, Washington, for the practice of general surgery. Dr. Nunn was formerly associated with the Mayo Clinic, Rochester.

Dr. L. R. Peck, graduate of the University of Minnesota, 1929, has established a practice at Hastings and Hampton, Minnesota. Dr. Peck was an interne at St. Barnabas Hospital, Minneapolis, the past year.

Dr. Philip Bray and Dr. Donald Dukelow, who recently completed their interneship at Miller Hospital, Saint Paul, are taking fellowships in pediatrics and dermatology, respectively, at the Minneapolis General Hospital.

Dr. D. C. Wirtz, who was resident physician of the Gillette State Hospital for Crippled Children, from July 1, 1929, to June 30, 1930, has recently opened offices at 414-415 Southern Surety Building, Des Moines, Iowa, doing general practice and orthopedic surgery.

Dr. H. R. Anderson, who interned at the N. P. B. A. Hospital from July, 1929, to July, 1930, has opened an office at Twenty-seventh Avenue and Lake Street, Minneapolis. He is engaged in general practice in the view to specializing in surgery later.

Dr. M. H. Siefert, who interned at the N. P. B. A. Hospital from June 1, 1929, to June 1, 1930, was married to Miss Laura Dupont on May 31, 1930. Dr. Siefert has opened his office at Excelsior, Minnesota, where he is engaged in general practice.

Dr. Lorenz Boehler, of Vienna, was in Rochester July 17 and was entertained at a dinner given by the Olmsted County Medical Society, seventy guests from Rochester and vicinity being present. In the evening Dr. Böhler gave a lecture before a large audience on his new methods in the treatment of fractures.

Invitations to the dinner and lecture were sent out to members of the State Society in the First Councilor District.

THE BAKER BALLYHOO

Norman Baker, the high-pressure gentleman at Muscatine, Iowa, who has recently invaded the medical field with two quack cancer cures—those of Ozias and Hoxsey—continues to get publicity. This in addition to the very good job that he does over his own radio station, KTNT. Recently newspaper accounts have appeared stating that Baker had claimed that an attempt had been made on his life and that an attempt had been made to blow up his radio station. These reports were not confirmed. The only other newspaper items that have been noted regarding Baker are the reports of cancer victims who have died following the Baker Institute "treatments." (Jour. A. M. A., April 26, 1930, p. 1430.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

"Summer Complaints"

"The growls one hears in the good old summer-time!" sighs the bulletin of the Brooklyn Medical Society of the County of Kings. Interesting but astonishing reading for medical readers in Minnesota.

The aftermath of a hot dry summer plus a state medical meeting is certainly not general conviction that everything in the world is wrong with medicine in Minnesota.

The County of Kings commentator picks just a few of the complaints from the din about his ears. "The costs are too high . . . the rewards are too low . . . medical men back-bite . . . the specialist becomes wealthy in short order . . . the child of the generalist goes without shoes . . . hospitals are too few, too large, too elaborate, too congested . . . and cults are anathema or life savers as the mood directs."

He should come to Minnesota. In Minnesota "summer complaint" occurs only as a name in old fashioned medical literature. Otherwise there is a sound, unalterable conviction of the dignity and worth of a free, independent, solidly organized medical profession—and complaints are chiefly conspicuous by their absence, at least in the environs of medical society executives and committee chairmen.

"As a matter of fact," asserts the County of Kings commentator sturdily, "the medical profession is not so bad. It does do its sincere bit of work every day, every hour."

It does in Minnesota, Mr. County of Kings.

The Best of a Bad Bargain

"The ethical medical profession did its utmost to prevent the passage of the Porter Narcotic Bill.

"This sort of legislation was unnecessary, uncalled for, and superfluous in every respect. Further, it is of a piece with the menacing tendencies toward bureaucratic control, that, if unchecked, will soon work the destruction of our democracy.

"Any good that is accomplished by this new narcotic drug legislation will depend upon the wisdom of the president in the selection of the Commissioner of Narcotics and the wisdom of the Secretary of the Treasury in appointing a deputy commissioner. That these two officials should be chosen from the ethical medical profession stands to reason, from the point of view of human welfare. Blanketing as it does all drug usage from import and manufacture to distribution through many channels, it would seem that this statute gives the federal government a large hunk upon which to chew. To put it mildly, the situation is so complicated that it offers endless opportunities for leakage. The chemist, the doctor, the veterinarian, the dentist, and possible commercial contingencies are all to be considered. These separate and several interests may sometimes be analogous but they are scarcely coincident. It can be disputed with justice that a physician need not be appointed to handle commercial problems, and certainly there is enough lay dictation of medicine on hand now to save the medical profession from having its needs and requirements passed upon by somebody who knows nothing at all about medicine, though possibly a terrible amount about business."—*Illinois Medical Journal*, July, 1930.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of September will be as follows:

September 3—Bowel Obstruction.
September 9—Trench Mouth.
September 17—Cause of Flatulence.
September 24—Acne.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association will hold its annual meeting at Moorhead, Minnesota, Friday and Saturday, September 19 and 20, 1930.

These meetings are always well attended, and the usual attractive program is being developed for the occasion. The complete program is not yet formulated, but will include the following speakers:

Dr. Wm. Boyd, Professor of Pathology, University of Manitoba, Winnipeg—"Rheumatic Disease of the Heart."

Dr. P. F. Eckman of Duluth, Minnesota—"The Classification of Purpura."

Dr. W. C. Alvarez, Rochester, Minnesota—"Diagnosis of Gastrointestinal Disease."

Dr. H. W. Woltman, Rochester, Minnesota—"The More Common Diseases of the Spinal Cord."

Dr. E. T. Evans, Minneapolis, Minnesota—"Orthopedic Care of Poliomyelitis."

Dr. E. W. Humphrey, Moorhead, Minnesota—"The Open Treatment of Fracture."

Dr. Emil Geist, Minneapolis, Minnesota—Boehler's Treatment of Fracture."

Dr. James B. Carey, Minneapolis, Minnesota—Subject to be announced.

Dr. R. S. Allison, Minneapolis, Minnesota—"Bone Tumors."

Dr. Edgar Herrmann, Saint Paul, Minnesota—"Malaria and the Roman Empire."

Dr. C. W. Schougge, Bismarck, North Dakota—"Intestinal Obstruction."

Dr. M. A. Shillington, Saint Paul, Minnesota—"Spastic Constipation and Its Treatment."

Dr. Harold Hullsiek, Saint Paul, Minnesota—"Benign Polyps of the Colon and Their Relation to Cancer."

Dr. R. S. Ylvisaker, Fergus Falls, Minnesota—"Functional Disturbances of the Bowels."

Dr. W. H. Long, Fargo, North Dakota—"Consideration in the Management of Secondary Anemia."

Dr. F. E. B. Foley, St. Paul, Minnesota—"Plastic Operation of the Renal Pelvis for Hydronephrosis."

Dr. Wm. Baillie, Fargo, North Dakota—"Some Indications for Urologic Examination."

Dr. B. J. Branton, Willmar, Minnesota—"Ectopic Gestation."

Dr. M. H. Nathanson, Minneapolis—"Diagnosis and Management of Coronary Arterial Disease."

Other speakers on the program will be: Dr. J. A. Myers, Minneapolis; Dr. Max Hoffman, Saint Paul; Dr. A. Gibson, Winnipeg; Dr. J. D. Adamson, Winnipeg, and Dr. J. K. Anderson, Minneapolis.

The banquet is to be held Friday evening, September 19, 1930, and Dr. H. C. Cooney of Princeton, Minnesota, as president of the Association, will give his annual address. An address on "Publicity" is also to be given by Mr. Banshoof of Detroit Lakes.

The complete program will be mailed about September 1.

INTERNATIONAL ASSEMBLY OF THE INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

Among the outstanding medical meetings scheduled for the fall is the Inter-State Postgraduate meeting, October 20 to 24, inclusive, at the Minneapolis Auditorium.

In addition to prominent members of the profession from Canada and the United States, the program includes the following from abroad:

Dr. Paul Clairmont, Head of the Department of Surgery at the University of Zurich, Switzerland.

Mr. John M. C. Fraser, Regius Professor of Clinical Surgery at the University of Edinburgh, Scotland.

Dr. Edmund Gros of the American Hospital at Paris, France.

Dr. Emile de Grosz, Professor of Ophthalmology at the University of Budapest, Hungary.

Mr. John Stephen Lewis, London.

Dr. Ferdinand Sauerbruch, Professor of Surgery at the University of Berlin, Germany.

Mr. A. H. M. J. Van Rooy, Professor of Obstetrics and Gynecology, University of Amsterdam, Holland.

Dr. Henry Wade, Surgeon, Royal Infirmary of Edinburgh, Scotland.

Dr. William D. Haggard, Nashville, Tennessee, is President of the Association; Dr. George W. Crile, Chairman of the Program Committee; Dr. William B. Peck, Freeport, Illinois, Managing Director; and Dr. Edwin Henes, Jr., Milwaukee, the Executive Secretary.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

At the recent meeting of the American Association for the Study of Goiter at Seattle, Washington, Doctor William F. Rienhoff, Jr., of Johns Hopkins University, Baltimore, Maryland, received the annual award of $300 for the best essay dealing with the goiter problem. Doctors O. P. Kimball, of Cleveland, Ohio, and E. P. and D. R. McCullagh, Cleveland Clinic Foundation, Cleveland, Ohio, and Robert P. Ball, of the University of Louisville, received honorable mention.

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question*—Female nurse, age twenty-seven, weight 105 pounds. Past history of chorea in childhood and exposure to tuberculous patients while in training. Family history for tuberculosis negative. Present complaint dates back to summer of 1925 when she had hemoptysis of a few ounces of bright red blood and slight hemoptysis for several days following. She has had two or more similar afebrile attacks every year since. Excitement or exertion seems to be a factor in bringing on some of the attacks. Last March she coughed up bright red blood, one to four ounces, several times a day for five to seven days; feels better after hemoptysis. She has been losing strength since this last attack. In the last few days she has had two attacks of hemoptysis. Since January 1, there has been increased dyspnea and cough on exertion, some sub-sternal oppression, weakness, and slight loss of weight. In summer of 1928, I tapped her left chest and removed 1,000 c.c. of straw colored fluid which was negative for tubercle bacilli by guinea pig inoculation. Stereoscopic films of the chest four years ago were negative for tuberculosis. *X*-ray and chest examination negative since for tuberculosis.

   I have diagnosed her case as combined mitral stenosis and regurgitation on account of harsh, rumbling murmur ending in loud first sound at apex, slight left ventricular enlargement by *x*-ray; an apex beat as if a jet of liquid were pushed against the hand (no palpable thrill); a reduplication or rather gallop rhythm of P2 in third left interspace and normal blood pressure. What are possibilities in her case? Would mitral stenosis give such attacks of repeated hemoptysis, last attack lasting from four to six days? Can digitalis be safely given in such attacks?

   Answer—You have apparently ruled out pulmonary tuberculosis as the cause of your patient's hemoptysis. Mitral heart disease is a frequent sole cause of this condition. It is due to marked passive congestion secondary to a dilated left auricle and a congested pulmonary circulation or passive congestion combined with single or multiple infarction. Infarcts of the lungs occur frequently in connection with passive congestion. You state that the left ventricle is slightly enlarged by *x*-ray examination. Was this a six-foot plate or was it a flat plate in which a search for tuberculosis was being made? Enlargement of the left ventricle may occur in conjunction with mitral stenosis and regurgitation, especially when the regurgitant phase is more marked than the stenosis. Other causes would be associated hypertension, involvement of the aortic valve with a defect, or pericardial adhesions as a result of rheumatic infection of the pericardial sac. You did not state the temperature of your patient. Such a picture as you have described might be associated with active reinfection of the valves and mural endocardium.

   The patient is apparently decompensated and should be treated for myocardial insufficiency. The use of digitalis is not contraindicated. It is the only known way of treating such a patient with hemoptysis.

2. *Question*—A patient who has been injured comes to my office for care. I find it necessary to take *x*-ray pictures to aid me in making a proper diagnosis. The patient pays for his care and for the *x*-ray examination. To whom do the *x*-ray pictures belong?

   Answer—To the owner of the apparatus. In your case they belong to you. *X*-ray films are only a medium through which we gain certain information. They might be compared to a stethoscope or to a thermometer. If the examination was conducted in a hospital by you and the hospital owned the apparatus, the *x*-ray films would belong to the institution.

3. *Question*—A young man had been injured the night previously in an automobile accident, and he suffered several rather deep lacerations. These were cared for in the ordinary manner with thorough cleansing of the wounds with tincture of iodin and alcohol. After the wounds were dressed I told the patient that I would give him some tetanus antitoxin. He refused saying that he would rather take his chances with lockjaw than to take the serum. Should this patient develop tetanus, am I liable?

   Answer—No, you are not liable. It probably would be better in a case like this to obtain a written statement from the patient to that effect. Institutions use a regular form for this purpose, when patients sign out before the treatment is completed and against the advice of the physician. However, it probably would not make any difference in your case if witnesses were present.

4. *Question*—What is the cause and treatment of achylia?

   Answer—Achylia literally means absence of chyle which would include both pepsin and hydrochloric acid. In most instances achylia means absence of acid because the enzymes are not searched for. It is possible to have the enzymes present and the acid absent. Achylia occurs in apparently normal individuals, with advancing years, in certain families and in connection with several diseases, notably carcinoma of the stomach and pernicious anemia. The probable cause is atrophy of the glands of the stomach although it may be temporary depression. It is assumed that the condition follows chronic gastritis although this is problematic.

   The treatment of achylia is usually not started unless there are symptoms. Diarrhea is a fairly common complaint in patients with this disorder. When diarrhea or other symptoms develop, a bland, non-irritating diet is advised and dilute hydrochloric acid is given before meals.

OBITUARY

W. A. Frost, Ph.G.
1854-1930

Mr. W. A. Frost, one of the best known pharmacists in the state and one of the veterans in the profession, died August 12, 1930, at his home in Saint Paul, of heart trouble which had incapacitated him for a few weeks.

Mr. Frost was born in St. John, New Brunswick, April 11, 1854, and came to the States when sixteen years old in the employ of Caswell, Hazard and Company, the firm name later being changed to Caswell, Massey and Company.

He received his training in pharmacy at the New York College of Pharmacy, which later became incorporated with Columbia University. Upon leaving New York he came west and went into business under the firm name of Carlson Brothers and Frost at Willmar, Minnesota.

Several years later Mr. Frost came to Saint Paul and located under the firm name of Clark and Frost at Third and Robert Streets, when Third Street was the main business street of the city. When business left Third Street he moved to Sixth and Minnesota, where he was established until about 1890, when he moved to the present location at Western and Selby Avenues.

For twelve years Mr. Frost was president of the State Board of Pharmacy and for several years lectured at the University College of Pharmacy. He was elected honorary president of the American Pharmaceutical Association, an honor granted yearly to members who have been pharmacists for many years and whose practice in the service has been "distinctly professional." Many years ago he served as second vice president of the national organization and for three years was a member of the executive council.

Mr. Frost was a thirty-second degree Mason, a Scottish Rite Mason and for many years treasurer of the Summit Lodge and the building fund of that lodge.

Mr. Frost lived at 748 Goodrich Avenue, Saint Paul, and is survived by his widow and a niece, Mrs. Edward Schons.

Mr. Frost had a host of friends in the medical profession. Included among his friends were a number of the oldest physicians in Saint Paul, to whom he had lectured on pharmacy in the early days of the Saint Paul Medical School. His refusal to dispense liquor following national prohibition was an indication of his probity and adherence to his convictions.

Dr. John Frederick Russ
1866-1930

Dr. John Frederick Russ of Blue Earth, Minnesota, died at his home August 13, 1930, of cancer of the stomach. Dr. Russ was born in Buffalo, New York, in 1866. His medical training was received at the University of Iowa, where he received his degree in 1893.

Dr. Alfred Erwin Comstock
1872-1930

Dr. A. E. Comstock, Saint Paul, died a few hours following a stroke July 24, 1930, at his home. He was born at Fayette, Iowa, February 21, 1872, and was the eldest of six.

In 1895 Dr. Comstock obtained the degree of B.S. from the Upper Iowa University and M.D. from the Hahnemann Medical College of Chicago in 1899. He came to Saint Paul in 1900, and was associated for a year and a half with the late Dr. W. S. Briggs. His practice of late had been limited to surgery.

For some ten years Dr. Comstock was professor of surgery in the homeopathic department of the University of Minnesota, and for the past twenty-one years was chief surgeon for the Beneficial Association of the Omaha Railroad. He was a member of the staffs of St. Joseph's and St. Luke's Hospitals and for more than twenty years was visiting surgeon at the Ancker Hospital. At different times he had the benefit of postgraduate study at Vienna, Paris, London and Berlin.

Dr. Comstock was commissioned captain in the Medical Corps at the time of the World War and spent six months overseas attached to Mobile Hospital No. 103. From April, 1926, to February, 1929, he was executive secretary of the Minnesota State Board of Medical Examiners and at the time of his death was a member of the University, Minnesota, and Town and Country Clubs. He was also a Royal Arch Mason.

On February 8, 1907, Dr. Comstock married Miss Minnesota Berkey of Saint Paul, who survives him with a daughter, Minnesota, and a son, Alfred Erwin, Jr.

TESTICULAR GRAFTING

At the International Physiological Congress in Boston last summer, Voronoff boldly reported in relation to his widely proclaimed testicular grafting that the successive phenomenal results of the transplantation are now definitely established. Recently, Moore has discussed the astounding claims that are prevalent in this field and remarks that the absence of dependable indexes for the alleged "hypogonadism" in man, or the inability to utilize proved indicators for hormone introduction by any means, appears to have caused but little concern to clinicians employing these supposedly remedial measures. Astonishing as it may be, published statements of the effect of hormone introduction, or alleged hormone increases from the intact organs, claim improvements for conditions that fairly well exhaust the ills to which man has fallen heir. Moore concludes that there is no known acceptable evidence that non-viable testes grafts, that is, grafts that fail to become incorporated with the body and actively secrete, exert any immediate or remote beneficial effect on the host organism. (Jour. A. M. A., July 19, 1930, p. 203.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of May 17, 1930

On Wednesday evening, May 17, 1930, at the Minnesota Club, St. Paul, the Minnesota Academy of Medicine, in lieu of its regular May meeting, gave a Founders' Dinner in honor of the living members of the group that founded the Academy in 1887. There were 75 members and guests present.

Dr. Emil S. Geist, President of the Academy, acted as toastmaster.

Dr. Geist: Members of the Academy: In honoring our guests this evening we but honor ourselves. Of the forty founders of this association, ten are living today. They are

Dr. Frank Allport
Dr. R. O. Beard
Dr. J. W. Bell
Dr. H. M. Bracken
Dr. William Davis
Dr. F. A. Dunsmoor
Dr. J. F. Fulton
Dr. W. A. Jones
Dr. Justus Ohage
Dr. Thomas S. Roberts

We regret that Drs. Allport, Bracken and Dunsmoor are not with us this evening.

You will note that the majority of these gentlemen hail originally from Minneapolis, which may be proof that perhaps after all Minneapolis is a more salubrious city than St. Paul.

1887! That was the year of the founding of this Academy. At that time St. Paul had about 115,000 inhabitants and Minneapolis perhaps a few more. That was the time of the great "census war" when there existed much rivalry between the sister cities. Even the inhabitants of cemeteries were counted as "population" and no doubt our honored guests did their level best at that time to increase the population.

That was the time of the horse, the gas lamp, the horse-car and the cable-car.

St. Paul was a much smaller city than it is today. The Cathedral stood on the site occupied by the Hamm Building, filled as it now is with doctors. Can this be termed progress?

The end of Summit Avenue was at Dale Street. Beyond that was wilderness. Third Street was the chief business thoroughfare. Who of us does not remember the Tivoli and the Merchants Hotel? Who does not recall the old Windsor Hotel, located as it was across the street from the building occupied by a large group of physicians? And its bar?!!

To get to Minneapolis was a hardship. One availed oneself either of the railroad or took a horse and buggy. In either event it was a day's journey. Minneapolis had emerged from being St. Anthony Falls. Washington Avenue was "the" business street. It was the day of the Exposition Building and the "Panorama." The University was still a baby. There were not only large flour mills but also large lumber mills, the latter now a thing of the past.

In those days golf was unheard of. For amusement the doctors went fishing, boating and hunting. The Mississippi River, our finest asset, was much used for these purposes. It had not yet become a glorified sewer.

In introducing the first speaker, I am introducing the man whose mind conceived this organization. He was also its *first* President. He is with us tonight, as young as he ever was.

I take great pleasure in introducing Dr. John F. Fulton of St. Paul. (Applause.)

Dr. Fulton: In October, 1887, a few representative medical practitioners of the Twin Cities assembled in the West Hotel, Minneapolis, for the purpose of organizing a medical society with the intention of bringing together all of the specialties in medicine and thus combine the most powerful aids for the advancement of general medicine and surgery, keenly appreciating the fact that the specialist whose education is not well-founded on the art and science of general medicine is not worthy of recognition by the profession, and believing that the specialist, from the enthusiasm in his profession, devotes his entire life to the double object of planting seeds gathered from the great stores of general medicine into his special soil in order to return gratefully to general medicine the harvest which is ripened fruit. A specialist can make no advance or discovery in his field which will not have a beneficial effect upon all branches of medicine. So it was the wish of those who organized this Academy, expressed in the language of another, that each specialty should be a diamond held together by a string of gold which is scientific medicine and surgery.

Ophthalmology was the first specialty to establish itself as such. But no class of men have been so constant and determined in retaining their coöperative relationship with other branches of medicine. As an illustration, Doctor Cushing, in a recent address, referring to the maladies of the optic chiasm, remarked that this was the crossroads where the ophthalmologist, the physiologist, the pathologist, the neurologist and the general surgeon met, but the ophthalmologist holds the right of way. The association of the oculist and the neurologist has always been most intimate.

In 1865 Sir Hughlings Jackson said, "It is imperative in all cases of cerebral disease to examine the eyes with the ophthalmoscope whether the patient complains of defect of sight or not. The intraocular condition most frequently discovered is double optic neuritis and it is very common for this to exist in a patient who can read the smallest type and who supposes his sight is good."

In a recent address, Dr. Edward Jackson declared: "It is a modest inference going little, if any, beyond what individuals have already received, who claim that ophthalmoscopic examination of the optic nerve will, in the very near future, play as important a part in the observation of general disease as the feeling of the pulse did seventy years ago."

This is a very strong indication of the progress that

has been made in the development of the ophthalmoscope as a diagnostic instrument in general practice from the days of Sir Hughlings Jackson, of England, to the present day of Dr. Edward Jackson of America.

No one gave a greater impulse to the value of the ophthalmoscope in diagnosis than Sir Clifford Allbutt. His epoch-making monograph on the use of the ophthalmoscope in diagnosing diseases of the brain and spinal cord and of optic neuritis in pyemia is one of our most useful textbooks today.

The importance of medical opthalmology was quickly recognized by American physicians, among the first being S. Weir Mitchell. I know that every member of the Academy is familiar with his magnificent work along this line. It was this genius of our profession who first used the word "eyestrain" in his classification of headaches.

Other American authorities, such as William F. Norris, of Philadelphia, during my student days, insisted that all patients in the University Hospital of Pennsylvania should have careful ophthalmoscopic examinations.

The relation of the eye to the central nervous system has been referred to as the "bulletin board of diseases of the brain and the spinal cord." Of the twelve cerebral nerves, six are distributed partly or wholly in the eye and its appendages.

Now that so many of us are in a historical turn of mind, I am reminded that I was in Berlin when Koch first announced his tuberculin treatment of tuberculosis before it had been thoroughly investigated. It was claimed at the time, as I remember, that he was forced to do this by the high government officials on account of the international medical convention which was in session in Berlin at that time.

Mr. Treachor Collins, of London, was one of the first to test tuberculin therapeutically for ocular tuberculosis. The pathology being situated as nodules on the edge of the pupil, the result was disastrous, starting up a severe reaction which resulted in the loss of the eye. This did not discourage Mr. Collins, however, from continuing the use of tuberculin therapeutically for ocular tuberculosis, as he has recently pronounced it a most reliable and satisfactory remedy for this condition.

It is to be hoped that this Academy will use its influence to establish a great library in this community, such as the one that has recently been opened in the East, and others that are about to be opened, in which will be stored all of the treasures of medical literature. In the language of one who is the maker of books himself and a lover of books and literature, "It should not be a graveyard for the accumulation of volumes only to be forgotten, but in which there is a spirit world of books, useful to all who know how to use them."

The doctor need not go outside of his own profession in order to find absorbingly interesting literature. The chapter in Ballory-Radot's Biography of Pasteur on the working out of a vaccine for the relief of hydrophobia is the most thrilling and interesting that can be found in any literary production. And Cushing's Life of Osler is one of the most popular books that has been written in many years. If there is any member of this Academy who has not read it, he has a great treat ahead of him.

Since this Academy has been organized ophthalmia neonatorum has been eliminated; sympathetic ophthalmia is a rarity, and trachoma is confined to localities where hygienic conditions are not obtainable.

But what of the future? What will we have to report forty years from now? We are expecting much. Our hope, however, hangs on physiology, biochemistry and biophysics. The two conditions that will be most improved by such progressive development in opthalmology will be glaucoma and lenticular and corneal opacities. In regard to the latter, Duke Elder in a recent address expresses himself as follows: "Cataract, as we have seen, is another purely physico-chemical problem, the denaturation, hydrolysis and coagulation of the proteins of the lens—and the essential opacities which occur in the cornea seem to be of the same nature. All of these conditions will before long be explicable, and all of them should eventually be curable or preventable by physico-chemical means"; all of which I endorse.

With a more thorough knowledge of the internal fluid circulations of the eye and the study of the function of the supplementary system of circulation, known as the lymphatics, we have every reason to hope that the syndrome known as glaucoma will become preventable and then, when it does occur, its course will be checked from the disastrous course which we now think is inevitable.

I am enthusiastic in the belief that this Academy will continue to be a careful recorder of clinical observations, the encourager of laboratory investigation, and a just endorser of new, meritorious therapeutic agents.

I cannot do better in closing than to repeat a quotation from Sir T. Brown, as I did in my first address to this Academy, "Where Nature fills the sails, the vessel goes smoothly on, and where judgment is the pilot, the rate of insurance need not be high. Where industry builds up Nature, we may expect pyramids, but where this foundation is wanting, the structure must be low. They do most by books, who could do much without them, and he that chiefly owes himself unto himself, is a substantial man." (Applause.)

Dr. Geist (introducing Dr. Bell): In 1887 Lake Harriet was far away from Minneapolis. It was used for picnic purposes. Today it is surrounded by dignified city homes. It was my privilege to invite the next speaker at one of these homes. Dr. Bell has seen Minneapolis grow from infancy to mature manhood. During that time everything about Minneapolis has changed excepting himself, who has remained ever youthful. I take great pleasure in introducing Dr. John W. Bell, of Minneapolis. (Applause.)

Dr. Bell: On an occasion of this kind we naturally focus our attention upon the past. As early as 1885 the progressive physicians of the Twin Cities felt that

the time had arrived for the founding of a State Society that would especially appeal to those interested in original work.

Fortunately the founders of the Minnesota Academy of Medicine were not confronted by the unfortunate situation existing today of innumerable and overlapping medical societies and organizations, tending to weaken rather than strenghen the county, state and national groups. Personally, I feel that Drs. Fulton, Abbott, Wells and Beard are largely responsible for the birth of this organization.

Our first Secretary, Dr. R. O. Beard, who continued to labor for fifteen years in the interest of the Academy, undoubtedly had much to do with shaping its policy and destiny. It gives me great pleasure, after the many years of useful and unselfish service he has given to the Academy and to Medicine in general, to have him still active in Public Health work.

The Minnesota Academy of Medicine has had, and will doubtless continue to have a prominent part in shaping the course and destiny of things medical in the State and Northwest. (Applause.)

Dr. Geist (introducing Dr. Ohage): The next speaker your all know. I think perhaps you know him better than I do; I am still trying to figure him out. I take great pleasure in introducing Dr. Justus Ohage, of St. Paul. (Applause.)

Dr. Justus Ohage: Gentlemen: Being one of the charter members, and perhaps the oldest, of this organization, the present President, Dr. Emil Geist, of Minneapolis, requested me to make a few remarks about surgery at the present time compared to that half a century ago. A few years ago I had the pleasure of visiting one of the largest and finest clinics in the country, the Mayo Clinic at Rochester, Minnesota. Its grandeur, thoroughness and success were a marvel to me and I could not help comparing the facilities and resources of this institution to conditions which I had to face 50 years ago. Then there were but few hospitals, most operations were done in private houses under very bad aseptic conditions, different assistants, few nurses and often after hard and strenuous trips. My main reliance, and it is still the best, against sepsis, was scrupulous cleanliness with bichloride as an adjuvant. Often I had to be my own assistant, caretaker of instruments and dressings, while the local surgeon administered the anesthetic.

I will recite you only a few cases out of very many. In the winter of 1883, Dr. E. Y. Chilton, of Howard Lake, Minnesota, called me for an operation for intestinal intussusception. The doctor met me with his cutter at the depot and after an eight-mile ride over rough roads and snowbanks at 35° below zero, we arrived at the farmhouse where the patient lived. I operated, Dr. Chilton gave the ether, and an old farmer with a huge beard held the kerosene lamp for light. He got his whiskers over the lamp chimney, which set his beard afire. He fell and fainted, the lamp exploded and set the kitchen where we operated on fire. I had just relieved the obstruction and was ready to close the abdominal wound. I lugged the patient into the cold adjoining room, the fire was extinguished and I closed the abdomen, dressed him and put him to bed He made a clean recovery.

A year later I did an ovariotomy for Dr. Wm. Lincoln at Wabasha, Minnesota. The patient was the wife of the railroad section foreman. The operation was done in the sitting room of the section house. Dr. Lincoln assisted and a druggist gave the anesthetic. The operation was an easy one and after removing the tumor, Dr. Lincoln sponged out the abdomen while I was getting the sutures ready. At that period I used sea sponges previously boiled. Upon inquiry he answered me that everything was out. I closed the abdomen, applied the dressing and had the patient put to bed. I had heard of things being left in an abdomen and their dire consequences and always counted every instrument and sponge before and after an operation. Everything was accounted for but instead of six, I could find only five sponges—one was missing. We hunted all over the room, under tables and in closets, in the yard where the bloody water was thrown—but no sign of the sponge. I concluded if it was anywhere it must have been overlooked and still be in the abdomen. By this time her husband had joined in the hunt and he became rather boisterous and not very complimentary in his vocabulary. The situation was not a pleasant one. A wild, powerful Irishman, his wife just recovering from the anesthetic and a sponge in her abdomen! A last I succeeded in getting the patient back on the table, reopened the wound and found the sponge behind a coil of intestines. The patient made an uneventful recovery.

In the year 1886 I operated in St. Joseph's Hospital two cases for gallstone trouble: the first was a cholecystotomy and the other a cholecystectomy. Both cases recovered and lived to a good old age. They were the first cases ever operated in America. I published them in the "Medical News" of Philadelphia, Feb. 19 and 26, 1887, then the leading medical journal in the United States. I incidentally mention this as Dr. Geist claims the honor of priority for a member of the Minnesota Academy of Medicine. The feasibility and success of these operations having been established, they are now frequently done and have saved many lives and allayed suffering.

When the new and modern St. Luke's Hospital on Smith Avenue was dedicated, I was selected to do the inaugural operations: a resection of the stomach for malignant disease, and another patient for gallbladder trouble.

I operated before the senior class of the State University. Among the students were four young women. I was always skeptical about women entering the medical profession and at this occasion thought their attention was rather poor. I looked for a little revenge. During the gallbladder operation, I saved a little of the bile in a tumbler and with my talk about the operation I drew attention to the necessity of close observation. The *vox viva* of the teacher and an occasional addition of a little "Attic salt" will make a lasting impression. "Some of you," I told them, "may

settle in a small country town and get into a talk with some of the old wise women of the place. They will watch and judge you. They may ask your opinion about poor Mrs. Brown vomiting yellow bile and bitter as gall. So you may know everything about bile, I pass this sample. You can tell its weight, see its color. smell its odor, and if you do as I do, put the tip of your finger in it and taste it, you can tell whether it is bitter or not. Now have you all examined it?" "Yes." "Is it bitter?" "Very." "Then you all are poor observers. You did not observe that I put my middle finger into the bile and my index finger in my mouth."

The Minnesota Academy of Medicine has well done its share in advancing the progress of medical sciences and will certainly continue to do so.

Vivat—Crescat—Floreat! (Applause.)

Dr. Geist (introducing Dr. Roberts): In 1887 the next speaker was a young man. He is still a young man. He was then an excellent physician and ornithologist. He is still the same. During the past years he has devoted more of his time to his glorious hobby —"birds"—and his work for, about and among them is known all over the country. Long may he live! I take great pleasure in introducing Dr. Thomas S. Roberts, of Minneapolis. (Applause.)

Dr. Roberts: I wish to take this opportunity of thanking the committee that arranged this dinner. I was not aware until notified by our President and Secretary that I am entitled to a place among the Founders of the Academy. Such being the case, the honor must have come through the courtesy of my friend and preceptor, Dr. A. W. Abbott. I had the good fortune to be in his office for two summers before, and to be his surgical assistant for nearly seven year after my graduation. A more kindly, unselfish and loyal friend no young man ever had.

Dr. Ohage has told you of the primitive conditions under which surgery was often done in those pre-hospital days. The operating room was not infrequently the kitchen or living room of the patient's home and the operating table was usually the kitchen or laundry table. The helpers were members of the family or interested and curious neighbors; trained nurses were few and far between; the kitchen kettles and pans and stove provided the means for such sterilizing as was done; and not many of the things considered so essential today were at hand. However, the results were surprisingly good considering the increased risks incurred from the present point of view. Some years ago Dr. Abbott read before this academy a paper presenting in his happy manner a picture of those good old primitive pioneer days.

Having mentioned Dr. Abbott as a physician and surgeon, I may perhaps be permitted to present him in another aspect, unknown I imagine to most of you who knew him well in and out of the Academy. When I first became acquainted with the Doctor, I was acting as Secretary of the Minnesota Academy of Natural Sciences. Many of the original members of that organization were physicians, as it was the era when medical men quite generally were interested in the natural sciences. As a boy I turned naturally to such pursuits, attended the meetings of the Academy and became a member while still a student in the Minneapolis schools. A little later Dr. Abbott was admitted to membership and it is of his hobby or special interest that I wish to speak. He believed, whether independently or not I cannot say, that it might be possible to determine the age of a fish by studying the concentric lines of growth on the scales. He collected considerable material and made a beautiful series of enlarged fish scales of various species. The Smithsonian Institution and the United States Department of Fisheries with Dr. Spencer F. Baird in charge became interested in the Doctor's work and a correspondence developed. Dr. Abbott was preparing a paper embodying his findings which was to be illustrated with his drawings, but, becoming more and more occupied with a rapidly growing practice, he gradually drifted away from his project and failed to establish the truth of his thesis. Now, curiously enough, this is the recognized means of determining the ages of fishes. Had not Dr. Abbott become so absorbed at that time in the practice of his profession, it seems certain that he would have carried his studies far enough to have become a recognized pioneer in this scientific, but practically important, line of research. Dr. Abbott had a scientific, inquiring type of mind but he allowed his profession to stifle all outside interests. Today whenever I chance to open a work on ichthyology and see the illustrations of fish scales, depicting the regular series of striæ, my mind goes back to the beautiful collection of drawings that Dr. Abbott made so many years ago.

In closing, I wish to add my appreciation of the honor paid by you tonight to the small group of Academy Founders gathered around this table. (Applause.)

Dr. Geist (introducing Dr. Davis): In 1887 I was a nine-year old boy living in St. Paul. Our home was situated on the street running between St. Luke's Hospital and St. Joseph's Hospital. I recall seeting Drs. Wheaton, Stone, Fulton, Gillette, Ohage and others passing by in their buggies, vying with each other as to who had the "classiest" rig. Of these, I think Dr. William Davis' outfit attracted my attention more than the others; possibly because he had the best horse. I take great pleasure in introducing Dr. William Davis, of St. Paul. (Applause.)

Dr. Davis: Mr. President, Members and Guests of the Academy. An old camp-meeting preacher introduced his sermon with the modest statement that he would now proceed "to limit the illimitable, to fathom the unfathomable and unscrew the inscrutable." The inscrutable which I propose to unscrew is the beginning of the Academy. Previous speakers have given you their version. I will tell you now just how it was begun.

In October, 1887, the late Dr. Perry H. Millard came to the office which I shared with Dr. Witherle and told us of a plan to found an Academy of Medicine, made up of twenty men from St. Paul and twenty from Minneapolis, to hold monthly meetings alternately in the two cities. Dr. Millard was a great getter-up of things. It was largely through his instrumentality

that our State Medical Practice Act was brought about, and Minnesota was one of the first states to pass such a law. Then, too, he was foremost in establishing a teaching faculty at the Medical Department of the State University. There had been a medical faculty but it had been a paper faculty only. Dr. Millard accomplished the difficult task of getting the faculties of the St. Paul Medical School and of the Minneapolis Hospital Medical College to come to such an agreement as to unite and form the present Medical School of the University of which we all are so justly proud. When he told Dr. Witherle and me about the proposed Academy and said, "and you two gentlemen are invited to join," I was very glad to accept, for at that time the local medical societies were at a very low ebb. The profession in Minneapolis were divided into two hostile camps that fought one another tooth and nail. Many of the good men would not belong to the Hennepin County Society and had formed a new one, the Minneapolis Society of Physicians and Surgeons. Indeed, the antagonism was so bitter that a Minneapolis doctor whom I had known in the East told me seriously that he believed some of the men in the other camp had tried to instigate a malpractice suit against him. In Ramsey County we were more harmonious, but there was no enthusiasm for the Ramsey County Medical Society, which met around in doctors' offices, often cheerless and dimly lighted rooms, usually with no program prepared and with the scantiest attendance. Indeed, of one meeting the secretary, Dr. Spencer, made the report that those present were the president and secretary and his, Dr. Spencer's, dog Peter, and he drew a picture of Peter on the minutes, a picture which is on the records today.

From the start the Academy was a success, although it suffered from several handicaps. For one thing, the only transportation between the cities was by the steam railroads which ran half-hourly trains up to nine o'clock at night and less frequent trains after that. Then, too, there was sure to be a preponderance of the members from the city where the meeting was held. But when, three years later, through cars began to run on the street railway between the two cities, and when the meeting place was changed to the Town and Country Club, and best of all when the automobile came along and made access to the meetings quick and easy for us all, the attendance grew to such a point that at the April meeting the secretary reported that over fifty members had been present at the March meeting, and I am sure there were fully as many in April, while as for the enthusiasm, that leaves nothing to be desired.

There is an excellent story I read once called "The New Minister's Great Opportunity," which tells how a young minister, called to a country parish, found that almost the first duty expected of him was to conduct the funeral obsequies of the village patriarch, old Uncle Capen, who had just died over one hundred years old. And everyone said what a wonderful chance this was for the new minister to tell about Uncle Capen's remarkably long life. But when the minister came to look about for material for the expected eulogy he found very little to help him, for Uncle Capen had led a most colorless life. His occupations had been chiefly sawing wood and whitewashing, and he had much preferred to sit by the kitchen stove to doing either of these. He had taken no active part in social, civic, or political life. So when it came to the funeral, the minister spoke of the great age of the departed and then proceeded to tell of the great changes that had come during his lifetime. He described the invention of railway trains and steamboats, of the telegraph, of photography, and other inventions, and his hearers were delighted with the address. But afterwards one of the parishioners said to the minister, "I enjoyed your remarks at the funeral but there did not seem to be much about Uncle Capen in them." "No," said the minister, "but you must admit that I did not say anything that was not so."

Now I propose to borrow a leaf from the minister and instead of talking about the first members of the Academy and perhaps saying things that were not so, to look back at the changes that have taken place in medicine during the forty-three years of the Academy's lifetime. First of all I think it will be interesting to see what diseases headed the death list in 1887. Some of you will not be prepared to hear that the chief cause of death was cholera infantum, a disease that has disappeared entirely from medical nomenclature. And when we add the deaths from the related diseases, colitis, enteritis, enterocolitis, and gastroduodenitis, with moreover the large number of deaths ascribed to convulsions which were really the end result of diseases of the same class, the total is over four hundred, more than twice that of the number of deaths from the next on the list,—pneumonia. Cholera infantum and these allied diseases are all grouped together today under the title of the diarrheal diseases of infancy, the total deaths from which in St. Paul last year were sixteen. I am giving you the figures of St. Paul. Those of Minneapolis would be little different except that there was more typhoid there at that time because the city drank untreated river water.

The second cause of death, pneumonia, holds high rank today, being third in last year's list; but the third, typhoid fever, accounted for but four deaths last year. Tuberculosis of the lungs, then listed as phthisis, was fourth, and that has dropped now to sixth place. The next, diphtheria, caused only five deaths in 1928. Our list today is headed by heart disease, which was then eighth, causing fewer deaths than infantile convulsions. Next to heart disease, cancer now prevails. In 1887 cancer held sixteenth place. Certainly medical science has much to be proud of in that it has practically abolished three diseases that were prime causes of death at the time of the birth of this Academy.

The hospitals of 43 years ago were small and few in number, often merely dwelling houses made over for hospital purposes. Except during the typhoid season they had few medical cases and very few confinements. Today about four-fifths of the births take place in hospitals. Except for the insane there were no special hospitals like those for tuberculosis and for crippled

children today. Even the hospital for the insane was more often called an asylum than a hospital. There were no specially fitted operating rooms with their white enameled furniture, their sterilizing rooms, gloves, caps, and masks. If gowns were worn they were chiefly to protect the surgeon. Anesthesia was with chloroform or ether as the surgeon chose, and the choice between the two was about equal. Cocaine had just appeared but was used chiefly in eye operations. Local anesthesia came much later. The present-day clinics had not come into being. Will Mayo had been in practice but four years and Charlie Mayo had not even taken his degree, and the great clinic whose buildings rise like landmarks from the prairies of southern Minnesota had not even been dreamed of.

That was the era of antiseptics. Carbolic acid was going into the discard and bichloride was taking its place. For hand disinfection this was used in the strength of 1-1,000, for irrigation from 1-2,000 to 1-4,000, while instruments were sometimes put into solutions as weak as 1-15,000, which could have had little germicidal power. Asepsis and sterilization by heat came several years later. This was curious, because in 1886 Lawson Tait, of Birmingham, had published a series of 139 consecutive abdominal sections without a death. These statistics never were questioned, as in each case reported he gave the initials of the patient's name and the name of the physician by whom the case was referred. At this time Lister and Spencer Wells were satisfied with 85 to 90 per cent of recoveries. Lawson Tait scorned chemical antiseptics but he was scrupulously clean. He used water from the tap to wash out the abdomen and said he sometimes put a little carbolic acid into the bag of sponges to keep out the flies. The sponges, by the way, were real sea sponges, washed as clean as possible after each operation and used again. Yet no one learned from Tait that cleanliness, including boiling water, was the real thing.

It was only a year before the date of the Academy's birth that Fitz, of Boston, gave to the world the word appendicitis, and showed that what was then called typhlitis, perityphlitis, or often only inflammation of the bowels, was really a diseased appendix. Even in 1887 operation was rarely done except in the presence of a tumor or for manifest peritonitis. What a boon that word appendicitis has been to the profession! Who can measure the value in dollars and cents?

Ulcer of the stomach, now so common, was diagnosticated but seldom in those days. The books spoke of it as uncommon and discouraged its diagnosis unless hemorrhages were present. Ulcer of the duodenum was rarer still. Of course there was no *x*-ray, and other instruments of precision like the sphygmomanometer and the electrocardiograph had not been invented. Infantile paralysis in epidemic form was not known, nor was it regarded as communicable. Until 1889 there had been no epidemic of influenza for forty years and no one had seen it until it appeared that winter.

In obstetrics there have been great changes. In proportion to the number of births there were in 1887 ten times as many deaths from puerperal sepsis as there were in 1928. Most remarkable is the frequency of cesarean section today. In St. Paul the first successful operation of this kind was not done until 1889. Today cesarean section is done for slight degrees of dystocia, for placenta previa, for concealed hemorrhage, for eclampsia, for almost no reason at all or because mothers think it easier than normal childbirth. Indeed it is getting so popular to have babies come into the world by the front door that the lying-in wards of our hospitals may be obliged to put out the notice often seen at the entrance of apartment houses, "All deliveries must be made at the rear."

Of the cults and systems of medicine, homeopathy was active in 1887 and we were still mistakenly fighting it. Now that we consult with him and welcome him to our societies, the homeopath is becoming a rare bird. Osteopathy then was in its infancy, but as he grows up the osteopath is getting educated and no doubt will eventually become merged with us, like the homeopath. Christian Science was already active, but that is only our old acquaintance—faith cure—dressed up in the ungrammatical platitudes of Mrs. Eddy. Of quacks we have had John Till in Wisconsin plaster the backs of thousands and gather enough dollar bills to plaster his house inside and out. In California we have seen Abrams become a millionaire with his electronic device. Another quack whose name escapes me, but who reaped a great harvest by pretending to make a diagnosis by examining a drop of the blood, reminds me of a story told here some thirty years ago by our dear old friend, Dr. A. W. Abbott, about a quack named Dr. Jack who made his diagnosis by examining a specimen of urine. On one occasion a man brought him a bottle of urine to examine. The quack looked at it and said, "This is your wife's urine." "Right," said the man, "What is the matter with her?" The quack pondered a moment and then said, "She has fallen down stairs." "That's right," said the man, "how many steps were there?" "Nine," said the quack after a moment's hesitation. "You're wrong," said the man, "there were twelve steps." The quack looked at the bottle again. "Did you bring me all the urine your wife passed?" "No," said the man, "I couldn't get it all into the bottle and had to leave some behind." "Well," said the quack, "those other three steps were in the rest of that urine."

Cults may rise and disappear, quacks may flourish for their short day, but the science of medicine goes on like a mighty wave, not crushing all that lies in the path like the steam roller of the politicians, but lifting up and absorbing to itself all that it meets that is good. To this progress the Academy has contributed its full share during the forty-three years of its existence. I am proud to have been one of its founders, and I predict for it a long-continued career of usefulness by contributing to the enjoyment and professional advancement of the medical men of this part of the Northwest. (Applause.)

Dr. Geist (introducing Dr. W. A. Jones): The next speaker whom I am about to introduce needs no

introduction. We all know him and love him. We have just heard Dr. William Davis, who was the first editor of the Journal-Lancet. It is fitting for us to hear from the present editor of that publication. I take great pleasure in introducing Dr. W. A. Jones, of Minneapolis. (Applause.)

Dr. Jones: I hardly know where to start in an attempt to talk, but I am very much impressed with Doctor Davis' talk on the diseases of those days and the fact that he did not mention marasmus. No one knew what it was. A non-medical man started an investigation to find out what it was. Since then it has disappeared entirely.

I recall a great many incidents in my brief career which were very interesting. I remember once I was consulted by a medical man who had a lady patient with him. He said he had studied the case very carefully and thought it was a case of inflammation of the prostate gland!

I want to tell the Academy that I am one of the proud members of this organization but I did not remember that I was one of the founders of it. I am very glad to be a member, and have watched its progress and enlargement since 1887. It doesn't seem possible that a man could get along with so many medical men so amicably. I want to extend my thanks to them and I hope they will always be successful as physicians and hope they will keep up their membership not only in this organization but in the State society and the American Medical Association. (Applause.)

Dr. Geist (introducing Dr. R. O. Beard): The next speaker is also known to most of us. There are few of us in this room who did not receive instruction from him—instruction the value of which we still appreciate. The chief memory I have of his lectures is that of a continuous flow of oratory. He, too, seems to have found what Ponce de Leon searched for in vain. I take great pleasure in introducing Dr. R. O. Beard, of Minneapolis. (Applause.)

Dr. Beard: Mr. President and friends of the Minnesota Academy of Medicine: As one of the founders of the Minnesota Academy of Medicine, I want to assure its members of our deep appreciation of the honor you have paid to us all—and alike to those of us who are living and to the lasting memory of those who have been lost to us during the forty-three years of the life of this remarkable body.

There were forty charter members of the Academy. It gives us pause and it quickens the embers of still warm remembrances in our minds to recall the fact that thirty of these forty men have already gone "to that bourne whence no traveler returns."

It is something for which we will be glad and grateful to the end that we have had the privilege of association and the joy of friendship with these whom we knew so long, whom we loved so well, and have so early lost. It is much to have worked, hand in hand and shoulder to shoulder, with men so rare as Abbott, MacLaren, Wheaton, Stone, French, Ritchie, Senkler, Clark Stewart, Nippert, Dunn and the many others who answered to our monthly muster-roll.

It is a happiness to know that these men, each in his own measure, were permitted to "snatch their narrow portion of time out of eternity"; that they were fitted "to do the work of men while they bore the form of them"; that they contributed greatly to the growth of the profession they loved, rendered their large service to mankind, lent something to the literature of medicine and to the literature, at large, of human thought.

We reverently salute the memories of these gone, but unforgotten friends!

The dawn of history is ever shrouded in more or less of mystery, and men have had to rely, more or less, upon tradition and recollection for the initial setting of any event. It is inevitable that in this half-light of other days the details we recall may, in some degree, differ. Great minds, it is said, move at a given time in one and the same direction.

I have been asked to give you some reminiscences of the Academy's past; and at risk that reminiscence is the somewhat faded fruit of the decadent years, I must needs comply with the request.

I remember then, a certain meeting of the Minnesota State Medical Society at Duluth in the spring of 1887. I recall the fact that, on the return trip, French, Hunter and I sat together, and that on the way French initiated a proposal to establish a select association of medical men and that the three of us discussed the possibility. I remember that, within a few days of our return, the same three met in Hunter's office and talked it over again. Then and there it was proposed that the Academy be limited in number and that its active membership should be drawn equally from the Twin Cities. I recall that we proposed three Saint Paul conferees, and that these three were Fulton, Wheaton and Stone; that French undertook to suggest the matter to these three brethren. Later, the six of us had a meeting which extended from Alex Stone's office to the Windsor Hotel in search of refreshments, and that other men were proposed by each and all of us. Among them were Ritchie, Riggs, and dear old Senkler, of Saint Paul, and Abbott, Allport and Dunsmoor, of Minneapolis.

On October 7, as the records show—and here actual history begins—an organizing meeting was held in Saint Paul, at which nine Minneapolis men and seven Saint Paul men were present. On October 12, a second meeting completed the organization.

It is a personal pleasure to the speaker to recall that he was privileged to write the Constitution, By-Laws and Standing Rules then adopted. The minutes of succeeding years show that while these documents were revised from time to time, they remain today the structural basis upon which the Academy was built and upon which it has rested ever since.

On November 5, 1887, the first regular meeting of the Academy was held, at which the first officers of the Academy were chosen. They included Dr. John F. Fulton, as President; Dr. A. W. Abbott, as Vice-President; Dr. LeGrand N. Denslow, as Treasurer;

while Dr. Edward C. Spencer and the speaker were jointly named as Secretaries.

For a year these two Secretaries collaborated, and the satisfaction of working with so essentially a Nature's gentleman as Edward Spencer is to be recorded. At the end of the first year, Dr. Spencer was assigned to the Treasurership and the speaker became the sole Secretary. In still another year, he was elected Secretary-Treasurer, a joint office which he filled for fifteen years. He may, perhaps, be permitted to boast of the possession of the unshared honor and the privilege of having served, in turn, as Secretary, Secretary-Treasurer, Vice-President, President, Fellow, and the Honorary Fellow, as, by your courtesy, he now ranks.

The pivotal point upon which the speaker believes the wonderful success and stability of the Academy to have turned is to be found in the stated purposes of its creation, viz., the cultivation of medical research and the association of medical men upon a basis of good fellowship, professional ability and literary merit. So strictly has entrance to the Academy been guarded by this statement of its objectives that the initial quality of its membership has been in its entirety continuously maintained. It has always been esteemed an honor to belong to the Minnesota Academy of Medicine.

In a time of professional differences and disintegration, the Academy has embodied a satisfying harmony. In the face of a progressive diminution of educational standards in the State, it has stood for lofty ideals. In the midst of current commercialism, on the one hand, and ethical fundamentalism, on the other, it has remained stanch to the highest traditions, translated into the modern spirit of medicine. In a day when pseudo-scientific research has easily passed muster, it has exercised real discrimination of medical values.

May I be permitted a word of greeting to my fellow-founders, all so warmly welcomed to this table.

I am glad that we still belong to The Minnesota Academy of Medicine. Although we need not now bear the burden and heat of its developmental years, in which we carried our fully-accepted share, we may continue to take our part in the councils which are functional to age and to grow young in the fellowship of its sustained youth.

We have lived in a past when Art has added much to Science and Science has carried Art aloft upon its lifting wings. We have lived in a present marked by vast material and mechanical progress and by still greater illumination of the human mind. We look out upon a future which promises the prevention of the human ills we have wrestled with, the advancing betterment of human being, the increasing longevity of humankind.

It is ours to hold an enlarging and enlivening memory of the days bone by; to grow still more greatly under the constantly expanding influence of these contemporaneous years; to vision with widening philosophy, with still gathering wisdom, with deepening understanding, the coming days.

It is not permitted to us to halt, for if we do the rapidly rising waves of this living present will pass us by. It is ours still to keep step with the constantly compelling movement of our times.

Like the native music of America, our lives are set to a minor key, and for the identical reason that gives us this native chord. The old age of the individual is like the old age of the race. Its face is turned toward the setting sun. But that minor key is the most beautiful in the entire gamut of musical sound. We may beautifully keep in tune with it.

We have reached the years when we may stand, if we will, by the lift of our past experiences, upon "those summits whence the eye sees the world as one vast plain and one boundless reach of sky."

In sweetness, quietude and seriousness, it remains to us "so to live, that when the summons comes to join the innumerable caravan that moves to that mysterious realm where each must take his chamber in the silent halls of death, we go not like the quarry slave at night, scourged to his dungeon, but sustained and soothed by an unfaltering trust, approach our end as one who draws the draperies of his couch about him and lies down to pleasant dreams." (Applause.)

Dr. Geist: Eternal Youth! Dr. Beard, you have made all of us feel young again. As I listened I was recalled thirty years back to that old physiology lecture room and its hard, hard benches; those straight-back affairs!

I now bring this meeting to a close. It has been fine to have had with us our beloved Founders. We regret much that some of them were not able to be with us.

Founders! May you live long and may we enjoy your presence for many years to come. All Hail to You!

Dr. Thomas Roberts then showed two reels of moving pictures of Minnesota's wild animal and bird life.

R. T. LaVake, M.D., *Secretary.*

POMPEIAN OLIVE OIL NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Pompeian Olive Oil was presented by the Pompeian Corporation for inclusion in New and Non-official Remedies. The Council explains that the product might be recognized as a brand of olive oil, U. S. P., marketed under the pharmacopeial name ("Pompeian" being used merely to identify the firm's brand) were it not that claims of unique advantage and therapeutic potency were advanced. The Council cannot admit in reference to this brand of oil the claim made that the "ease of its digestion and assimilation is far greater than that of any other vegetable or animal oil." After considering the evidence submitted by the proprietors, the Council decided that Pompeian Olive Oil is not acceptable for New and Non-official Remedies. (Jour. A. M. A. July 5, 1930, p. 35.)

UNIVERSITY NEWS

REPORT OF THE DEAN OF THE MEDICAL SCHOOL

To the President of the University of Minnesota

Sir:

I have the honor to submit the report of the Medical School for the biennium, 1928 to 1930.

FACULTY

Deaths.—On March 8, 1929, occurred the death by suicide of Dr. C. J. V. Pettibone, Associate Professor of Physiological Chemistry. Dr. Pettibone, A.B. University of Chicago, Ph.D. Harvard, several years of foreign study, had been connected with our school since 1912. As teacher and as Secretary of the Student Work Committee he rendered good service.

On April 3, 1930, Dr. C. Eugene Riggs, aged 77, Emeritus Professor of Nervous and Mental Diseases, died at his home in St. Paul. He was the pioneer of his specialty in the Northwest, was connected with the School from 1889 to 1913, and again gave active teaching service during the World War.

Resignations, Appointments.—Dr. Arthur A. Law, Associate Professor of Surgery since 1913 and connected with the department since 1899, resigned December 21, 1929. His services as teacher and as surgeon at the University Hospital were not only long in years but of high quality. There was never a time, day or night, when he was not ready to respond to an emergency call. His resignation was regretted by the department of surgery and the administration. By special vote of the Board of Regents a certificate of appreciation setting forth his services to the school, his honorable army record, his high standing in the profession and among the alumni of the University, was engrossed and presented to Dr. Law.

In June, 1929, Dr. Thomas Lee, Professor of Anatomy, former Director of the department, having reached the age limit, retired from active duty and, after a farewell dinner participated in by a great body of friends, moved to Florida. He had been on the faculty since 1891, and a host of students remember him with pleasure.

Dr. Fred L. Adair, Professor of Obstetrics and Gynecology, Chief of the service in these branches at the Minneapolis General Hospital, teacher and investigator of distinction, on our faculty since 1905, resigned October 1, 1929, to accept a professorship at the University of Chicago.

Dr. Frederick W. Schlutz, Professor of Pediatrics and Head of the Department, resigned April 1, 1930, to accept also a professorship at the University of Chicago. Dr. Schlutz had been a member of the teaching staff since 1910 and head of the department since 1924. He is recognized as distinguished in his specialty, as is evidenced by his call to his new position.

The resignations of Drs. Adair and Schlutz were prompted by the better salaries and opportunities offered by a heavily endowed university. It was with regret that we found ourselves unable to retain their services.

On January 1, 1930, Dr. A. C. Strachauer, Professor of Surgery and Head of the department, in accord with an arrangement entered into three years before, retired and Dr. Owen Wangensteen took his place Dr. Wangenteen, our graduate, M.D. 1922, Ph.D. 1925, has been preparing himself through more than ten years for a university career in surgery. During the three years mentioned he spent fourteen months abroad on university salary and the rest of the time mostly in our own clinic. He takes up his work as head of surgery under the full-time plan. Dr. Strachauer has also resigned as Director of the Cancer Institute but will remain on the faculty with rank of professor on the unsalaried basis. We thank Dr. Strachauer for his years of service in the school of which he is an honored alumnus.

The appointment of Dr. Leo Rigler, M.D. 1920, as Chief of the *x*-ray department, although it occurred before this biennium, may be referred to as another example of the wise choice of a promising graduate, his advanced preparation in his specialty in part at University expense and his promotion while still young to a responsible post. This method of filling the faculty is justifying itself.

The place of Dr. Lee was filled by the transfer from the Department of Zoology to the Department of Anatomy of Professor Hal Downey, distinguished authority on blood, whose investigative work in recent years had brought him gradually into the medical field. The change of departmental affiliation was therefore appropriate, but the School expresses a debt to the Zoology group for relinquishing so valuable a colleague.

The post of Dr. Adair at the General Hospital, with its important teaching duties, was filled by the promotion of Dr. John A. Urner from Instructor to Assistant Professor and his assignment to that institution. He is one of the capital young men who have trained here in the last few years and have adopted medical academic careers instead of private practice. We were fortunate to have such a man available.

Without permitting the school to become inbred it is the desire of the administration to have a good proportion of our own graduates on the faculty. However, in the case of the vacancy in Pediatrics it was thought that our local alumni would be more valuable as part-time men in the department, bringing to it the point of view of active practice, and the choice for the headship fell upon Dr. Irvine McQuarrie, Associate Professor of Pediatrics, Rochester (New York) University School of Medicine. Dr. McQuarrie, 39 years old; A. B., Utah; Ph.D., California; M.D., Johns Hopkins; Instructor, Yale; Head of Pediatrics Henry Ford Hospital; at Rochester since 1926, has published important contributions in his field, has a fine record as a teacher. He will take charge in August 1930.

In order to be with her aged mother, Miss Marion Vannier, Associate Professor of Nursing and Director of the School of Nursing, has resigned as of August 31, 1930. Miss Vannier, graduate of Johns Hopkins School of Nursing, came to the University Hospital in

1916, later was Superintendent of Nurses at the Miller Hospital, later still Superintendent of Nursing in the University Hospital, became Director of the School in 1924. Miss Vannier is an expert in nursing education and administration, and the school has prospered under her direction. We regret to have her leave the University.

Miss Katherine Densford, A.B. Miami, A.M. Chicago, Graduate of the Cincinnati University School of Nursing and Assistant Dean in the Cook County Hospital School of Nursing, has been elected to succeed Miss Vannier.

Absences on Leave.—The School was honored by the selection by the Rockefeller Foundation of Dr. Hilding Berglund, professor of medicine, as visiting professor at the Pekin Union Medical School, for the year 1928-29. Dr. Berglund returned to duty July, 1929.

Dr. J. C. McKinley, Professor of Nervous and Mental Diseases, was on sabbatical leave, 1928-29, studying chiefly at Breslau, Germany.

Dr. William Swanson, Associate Professor of Pediatrics, has spent his sabbatical, 1929-30, at Johns Hopkins University.

Intrauniversity Faculty Relations. — The Medical School is proud of the contributions made by its members to the broad problems of the whole University and mentions particularly the important work done by Professor R. E. Scammon* in connection with the Insurance Plan for the faculty and employees recently adopted by the Board of Regents.

ENROLLMENT

The details of student registration will be found in the Registrar's report. Suffice it here to say that the number of medical students averages about 135 in each of the four classes with an equal number in the fifth or intern year required for the M.D. degree.

We take one hundred into the Freshman class each fall, selecting them from 300 or more applications. In place of the "Unclassed" group formerly accommodated we now take 40 additional Freshmen on January 1. These students take as their official freshman year the winter, spring and summer quarters and in the fall join on equal terms the 100 fall quarter freshmen of the previous year to make up the Sophomore class.

Our number of students makes this the second largest medical school in the country. We feel the number is too large for the best results of teaching, notwithstanding our continuous use of facilities throughout the year under the four quarter system.

We feel further that the policy of preference to Minnesota residents prevents to a certain degree the selection of the most promising material from our large number of applicants. Most applicants residing outside the state have to be rejected, regardless of qualification. From the standpoint of securing the best prepared and most cosmopolitan student body the policy of Indiana University that its Medical School exists to prepare physicians for the state seems preferable to our presumably accepted theory that the Medical School exists to educate the children of the taxpayers.

These remarks on student enrollment concern themselves with medical students only. It is to be recalled that the Medical School administers also the Nursing School curriculum and the Medical Technicians curriculum. The enrollments in these courses are available in the Registrar's Report and other details will be found in the reports of the directors of these activities appended hereto.

The policy at Minnesota is that the Medical School, through its departments, teaches all students who need its disciplines as part either of a general education or of professional training. Consequently large numbers of students of Home Economics, Dentistry, Physical Education, Agriculture, Pharmacy, the Graduate School, etc., receive part of their training in the Medical School. These enrollments are naturally classified elsewhere.

COMPREHENSIVE EXAMINATION SYSTEM

During 1929-30 the Faculty has worked out and put in operation a system of examinations by which progress in the medical curriculum is made not by passing examinations on single courses but by a single examination on all the work of a given year. The thought is that the student should regard his education in terms of a large objective, should demonstrate capacity to keep in mind the essential substance of an entire year's work. Each year's examination is in charge of a special committee. The administration of all examinations is centralized. Dr. A. T. Rasmussen of the Department of Anatomy has done a noteworthy service as Chief Examiner. The first trial of the system this spring convinces the various committees that the comprehensive examination has advantages and that the number of failures, though distributed differently, is not increased over the old system.

NEW HOSPITAL UNITS

The completion in the fall of 1929 of the Eustis Children's Unit, the Out-Patient Unit and the Students Health Unit greatly increased and improved our teaching facilities along clinical lines. The number of hospital beds was increased to about 400, with adequate and beautiful quarters for children. The modern outpatient quarters led very soon to a distinct increase in number of patients available for this useful type of teaching. The bringing of the Student Health service to the Medical campus and its integration so far as bed patients are concerned with the University Hospital, have improved the Health Service, unified the University's hospital activities and brought the significant values of the Health Service as a community health movement more to the attention of future physicians.

READJUSTMENTS IN MILLARD HALL

The transfer of the out-patient service to its new quarters in the hospital group vacated considerable space in Millard and enabled the scientific departments therein to expand. Pharmacology in particular, which

*Since this was written Dr. Scammon has resigned to accept a position at the University of Chicago. This is a heavy loss to the University.

has been housed for fifteen years in Physiology space, gets adequate and convenient quarters in the north wing. Building changes essential to these readjustments are just being completed.

RELATIONS WITH THE MEDICAL PROFESSION

These relations have become measurably more harmonious and coöperative in this two year period. Three movements have contributed to this result.

The Alumni have become more active. Their Advisory Committee meets regularly with the Dean and Hospital Superintendent to consider school matters. During the meeting of the American Medical Association in Minneapolis in June, 1928, the alumni of our school held the largest meeting and banquet in the history of the School. Perfecting their organization they have instituted a clinical program each fall at Homecoming. The first was realized in 1929 and was satisfactorily attended. The entire program was put on by alumni, Dr. Otto Folin, distinguished biochemist of the Harvard Faculty and Minnesota graduate, being the guest of honor. Through these meetings an increasing number of alumni gain insight into the aims and problems of the School. To Drs. O. S. Wyatt and N. O. Pearce we owe much of value coming out of alumni interest.

The second activity contributing to better relations with the profession has been the Extension courses for physicians. While administered by the Extension Division the actual teaching has naturally fallen upon members of the Faculty. Weekly series of lectures of topics of value to medical men are offered in any part of the state when a center of interest exists. A considerable number of such courses have been completed and others arranged for. The State Medical Association contributes and coöperates. Dr. N. O. Pearce is largely responsible for the success attained. Of the full time staff Dr. W. A. O'Brien has contributed much time and effort to work among the doctors. We owe all these gentlemen a great debt. To various other participating Faculty members we give best thanks for a largely unpaid but very valuable service.

In this connection should be mentioned the informal consultation service developed as another joint activity of the Medical School and State Medical Association. This idea, again, emanates from Dr. Pearce, now President of the Medical Alumni; and Dr. W. A. O'Brien, Pathologist of the University Hospital, active publicist and tactful adjuster of difficult situations, is again the man selected to conduct the machinery by which doctors in rural practice can get expert information on troublesome cases. Dr. O'Brien on account of his peculiar abilities and on account of his position is also the choice of the State Association as radio speaker for the profession. This is an important educational effort. We are proud to have such a man as Dr. O'Brien available for activities like these just described.

Thirdly, as a factor in bettering relations with the profession and throughout the state should be mentioned the work of Mr. Paul Fesler, Superintendent of the University Hospital, among the doctors and county officials. He spends a good deal of time in the various districts and strives to make the hospital more useful both to physicians and to the sick poor. Through Mr. Fesler's efforts and with the invaluable help of Dr. Herman Johnson and Dr. C. B. Wright—to name but two of numerous influential physicians interested in the matter—the appropriation for the University Hospital has been separated from the general University appropriation and increased. Inasmuch as the hospital is chiefly justified, in popular view, as a service institution this arrangement is fairest alike to legislature, taxpayers and the University as a whole. Too much praise cannot be accorded Mr. Fesler for his kindly, tactful, diligent efforts to bring the hospital in accord with the ideals of the profession and increase its effectiveness as a central institution for unfortunate citizens.

RESEARCH

This school has always carried on active research along various lines. The program has been stimulated and expanded in the biennium by the special appropriation of $25,000 a year for medical research granted by the last two legislatures. This fund is apportioned to various projects advanced yearly by interested members of the faculty. More and more funds from outside sources are becoming available by gifts of individuals and corporations for special projects. Several departments publish their papers yearly as bound volumes of reprints. In a brief report details cannot be set forth. Those qualified to judge consider the quality and number of our publications as placing us among the noteworthy medical schools in this respect.

SYMPOSIUM

Early in 1929 the Director of the Summer Session proposed that funds be devoted to a limited number of special projects outside the ordinary routine of class work. Taking advantage of the fact that the International Physiological Congress was to meet (for the first time outside of Europe) in Boston in August, the Medical School and agricultural biochemical groups proposed that a Symposium on Physiology and Physiological Chemistry be held at Minnesota. The plan was approved and carried out July 15 to August 15. Distingushed foreign scientists contributing were Prof. M. von Frey, Wurzburg; Prof. T. Thunberg, Lund; Prof. E. Laqueur, Amsterdam; Prof. E. Waldschmidt-Leitz, Prague; Prof. G. V. Anrep, Cambridge. Several well-known Americans and our own men also participated. Attendance at these lectures was good. A large amount of interest was stimulated. The project will be continued this summer by a Symposium on "The Kidney in Health and Disease," July 7-18, under the chairmanship of Prof. Hilding Berglund.

ADVANCED STUDY

Graduate work in medical subjects and the training of medical graduates as specialists comes under the Graduate School and is reported by the Dean of that School. In this place is noted only that the number of such students getting training in the Medical School and under its faculty is increasing. Our men are going

out to good posts in other universities and filling vacancies in our own faculty. Some go to the higher walks of practice. The presence of the graduate group is stimulating in undergraduate education. The Medical School is proud of its participation along with the Mayo Foundation in the largest existing experiment in medical graduate education.

CONCLUSION

Taken broadly it is believed this review of its activities demonstrates that the Medical School is continuing its useful function as a teaching and investigative mechanism, has gradually strengthened its facilities and man force in the last two years, has widened its influence in the state and has contributed to the prestige of the University.

Respectfully submitted,

E. P. Lyon, *Dean.*

June 30, 1930.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

HEARING HELD ON RIGHT OF MASSEUR TO USE TITLE OF DOCTOR

On July 21, a hearing was held before the State Board of Medical Examiners to determine whether or not the license of a masseur who was using the title of "Doctor" should be renewed for the year 1930. Masseurs under the 1929 Massage Law are prohibited from using the title, "Doctor."

The masseur in this case, however, who maintains an office in Minneapolis, refused to comply with the law and appeared in person before the Board together with his attorney. After a very thorough hearing on the matter the State Board of Medical Examiners unanimously voted to refuse to renew the license unless within ten days thereafter the applicant removed his signs and complied with the law. On a check-up of the case at the end of ten days it was found that all the signs had been removed.

The indiscriminate use of the title, "Doctor," was one of the outstanding complaints made about the non-enforcement of the previous Massage Law and resulted in a repeal of that law at the 1929 Session of the Legislature. By their action in this case the State Board of Medical Examiners has served notice that it intends to enforce the Massage Law as well as the Medical Practice Act and Basic Science Law.

RICKETS AND VITAMIN D

Without detracting in the least from the market value of viosterol in the treatment of rickets, certain recent investigations raise a question as to the simplicity of the pathogenesis of rickets implied in the current use of viosterol. It has been pointed out recently that, whereas both viosterol and cod liver oil are extremely efficacious in curing rickets, only the latter contains in addition the indispensable Vitamin A. Although the most obvious function of calcium and phosphorus is in the building of bones, there are other demands for these mineral elements which, at times, become of great importance, and it has been shown that, whereas Vitamin D is concerned with the calcification of bones, the retention of calcium and phosphorus in the body is largely a function of the level of these materials in the diet. A comparison of the efficacy of cod liver oil and of viosterol as prophylactic antirachitic agents showed that of 123 children given viosterol 29 per cent were not protected against rickets, while of 100 given cod liver oil 3 per cent showed rickets, although the former group received twice the number of units of Vitamin D given the latter group. (Jour. A. M. A., July 5, 1930, p. 38.)

DESICCATED PITUITARY PREPARATIONS OMITTED FROM N. N. R.

In 1928 the Council on Pharmacy and Chemistry discussed the lack of acceptable evidence for the value of pituitary preparations administered by mouth and concluded that extensive clinical experience had failed to establish the value of desiccated pituitary preparations for oral administration. At that time the Council decided to omit such preparations when the period for the acceptance of the products included in New and Non-official Remedies should expire, unless new evidence became available in the meantime permitting a different action. At the expiration of this period no favorable evidence had become available. Accordingly the Council has directed the omission of all desiccated pituitary preparations now included in New and Non-official Remedies, namely: Desiccated Pituitary Body-Armour, Desiccated Pituitary Substance (Anterior Lobe)-Armour, Desiccated Pituitary Substance (Posterior Lobe)-Armour, Anterior Pituitary Desiccated-Lederle, Posterior, Pituitary Desiccated-Lederle, Whole Pituitary Desiccated-Lederle, Pituitary Body Anterior Lobe Desiccated-Mulford, Anterior Pituitary Desiccated-P. M. Co., Pituitary Substance-Desiccated-P.M. Co., and Posterior Pituitary Desiccated-P. M. Co. (Jour. A. M. A., July 19, 1930, p. 201.)

SUPER D BRAND COD LIVER OIL

The Upjohn Company markets a product "Super D Brand Cod Liver Oil." The advertising that is issued for this preparation reads as if the product were cod liver oil fortified by the addition of irradiated ergosterol. The Upjohn Company has not requested consideration of the preparation by the Council on Pharmacy and Chemistry and so far the Council has not reported on it. The Council has announced the acceptance for New and Non-official Remedies of the following brands of cod liver oil with viosterol 5 D: Abbott's Cod Liver Oil with Viosterol 5 D (Abbott Laboratories); Parke, Davis & Co.'s Cod Liver Oil with Viosterol 5 D (Parke, Davis & Co.); Squibb's Cod Liver Oil with Viosterol 5 D (E. R. Squibb & Sons); Squibb's Cod Liver Oil with Viosterol 5 D, Mint Flavored (E. R. Squibb & Sons). (Jour. A. M. A., June 14, 1930, p. 1939.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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PEDIATRICS

RELATIVE PROPHYLACTIC VALUE OF CONVALESCENT AND IMMUNE ADULT MEASLES SERUMS: E. Garrido Morales, M.D., Epidemiologist, and O. Costa Mandry, M.D., C.T.M., Director, Biological Laboratory, San Juan, Porto Rico (Amer. Jour. of Dis. of Children, Vol. 39, No. 6, June, 1930). The prophylactic use of convalescent measles serum with good results has been reported by various investigators.

The use of immune adult serum in the prophylaxis of measles has also been encouraged, but little evidence is found in the literature regarding the true value of this agent.

Data are presented in this paper which give immune adult serum, in proper doses, a definite place in the prophylaxis of measles.

Of 120 children exposed to measles by familial contact and immunized with convalescent serum, 102, or 85 per cent, were completely protected. Fourteen of the eighteen attacked in this group developed attenuated measles.

Of 132 children also exposed to the disease by familial contact and immunized with doses of from 20 to 40 c.c. of immune adult serum, 108, or 80.3 per cent, received complete protection and 20 of 26, or 76 per cent, of those attacked developed attenuated measles.

Doses of 10 to 15 c.c. of adult serum gave complete protection in less than 50 per cent of the persons immunized, but usually resulted in an attenuated or mild form of the disease.

Of 183 untreated children (controls) living in the same houses with patients who had clinical cases and with treated children, only thirty-four, or 18.6 per cent, failed to contract the disease. Only two children had mild reactions among more than 500 who received treatment with serum. It appears likely that a serious obstacle to the widespread use of convalescent serum will be the objection of some parents to the immunization of their children with serum obtained from strangers. Immune adult serum is readily and universally available, and the technic for obtaining it from adults or children who have had the disease is simple and does not involve any risk. Immune adult measles serum should be used with greater frequency for the protection of exposed children, especially for debilitated children, who probably die from the disease.

R. N. Andrews, M.D.

EYE, EAR, NOSE AND THROAT

SOME NON-SURGICAL AIDS IN THE TREATMENT OF GLAUCOMA: S. R. Gifford (Brit. Jour. of Ophthalm., Vol. XIII, No. 10, p. 481, Oct., 1929). Nearly all cases of glaucoma will at some time require surgical interference, and this should be done early, but in acute inflammatory and other conditions, it is necessary to postpone operative procedure for some time. In doing so it must be remembered that the visual fields and vision must be as carefully watched as the tension; also, that the tension varies during the day, it usually being higher in the morning.

Miotics should be tried in most cases, and these should be given frequently enough to keep the tension normal if possible. Eserine if used constantly often causes a conjunctivitis, so it may be necessary to alternate with pilocarpine and occasionally dilate the pupils for a short time with homatropine, to prevent the formation of adhesions.

Some of the newer methods may be used if further delay is necessary and high tension persists or as a pre-operative measure. Glaucosan is a dextro-rotatory adrenalin which shows no constitutional reactions on sub-conjunctival injection. A 2 per cent solution of ordinary adrenalin if instilled several times during an hour produces a mydriasis as great as that developed by subconjunctival injection of the 1/1000 solution. These are contra-indicated in the presence of any severe ocular inflammation. Their use is limited mainly to cases of simple glaucoma. Miotics should be instilled before using these and also immediately afterward, keeping the pupil well-constricted. The glaucosan is instilled (not injected) three to five times,

at fifteen minute intervals. Cotton pledgets soaked in 1/1000 adrenalin may be used under the upper lid, first anaesthetizing with butyn. The same results may be better obtained by a sub-conjunctival injection of four or five minims of the 1/1000 adrenalin. In a series of fifty cases all but fifteen showed an appreciable decrease of tension. The amount of decrease varies as well as the duration. In some cases the reduction lasts a month or longer with continued use of miotics. The vaso-neurotic type of patient responds much the best.

Amino-glaucosan is a 10 per cent histamin solution which rapidly contracts the pupil but frequently does not reduce the tension. It also has the disadvantage of frequently causing an inflammatory reaction.

Intravenous use of hypertonic saline solutions may reduce tension considerably by causing absorption of fluids from all the tissues, including the eyes, into the blood stream. It is especially useful pre-operatively in acute cases, or combined with miotics when they alone fail.

Some good but a variable reduction of tension has been reported in using ergotamine. This may be given sub-cutaneously or by mouth in doses of 1/60 to 1/30 of a grain. This drug has no effect on acute glaucoma and its use must be continued over a considerable period of time. It raises the blood pressure and depresses the sympathetic nerve endings. It is used in glaucoma on the idea that hypertension is caused by hyperactivity of the sympathetic system and that such a drug would diminish vessel permeability.

L. G. Flanagan, M.D.

RECURRENT HEMORRHAGES INTO THE RETINA AND VITREOUS—CALCIUM DEFICIENCY AS A POSSIBLE CAUSE: Charles A. Young. (Trans. of Amer. Acad. of Ophthal. & Otolaryng., 1929, p. 191). In one of the three cases reported, low blood calcium seems to be definitely the cause of recurrent hemorrhages. This patient had eight hemorrhages in the past three and a half years. Blood calcium was 6.5 mg. per 100 c.c. The following treatment was instituted for a period of three weeks out of every three months:

Gluco-Calx 5 c.c. intravenously twice a week.
Parathyrin 1 c.c. intra-muscularly twice a week.
Thyro-Calx tablets, 1 t.i.d.

There were no hemorrhages for the next two years.

The early hemorrhages seem to clear up rapidly, but in cases of repeated hemorrhages the vision is usually lost as a result of proliferating retinitis and detachment of the retina.

There seems to be many causes for repeated retinal hemorrhages and it might well be that two or more factors are present, but calcium deficiency should always be considered as a possible cause.

L. G. Flanagan, M.D.

REMOVAL OF LEAD SHOT FROM THE VITREOUS: George H. Cross. (Trans. of Amer. Acad. of Ophthal. and Otolaryng., 1929, p. 173). Vision even to 20/20 can be saved by removal of lead shot from the vitreous, with a pair of wire forceps and a double plane fluoroscope. The attempt at removal should be made at once, otherwise the formation of exudates makes the removal more difficult.

In June, 1927, the first successful removal of a No. 6 shot was reported. This resulted in poor vision (light perception), but saved the eye-ball.

A foreign body in the eye-ball is a critical injury and may result in a vitreous abscess, plastic inflammation, degenerative iridocyclitis, detached retina or phthisis bulbi.

It is difficult even with modern devices to localize a foreign body to within less than 2 or 3 mm. The instruments used must be short because of the close proximity of the fluoroscope. Incision is made through the sclera after the shot has been localized; then forceps are inserted and guided by the fluoroscope. After removal, the sclera is sutured and atropine is instilled. Of the four cases, in two of the foreign bodies were in the orbital tissue. In only one of these cases was the shot removed. In the other two, the foreign bodies were in the vitreous and were removed in both cases, resulting in one case in a vision of 20/20.

L. G. Flanagan, M.D.

CAPITAL PUNISHMENT

I am not a proponent of capital punishment, though I am certain, if it were really used all over the United States it would be a deterrent to murder. When anyone says to me that it is not, I cease to listen to him for he simply does not think. Capital punishment is not really used any place in the United States. Certainly in nations where murderers are morally certain that they will be caught, convicted and executed, the list of murders is infinitely smaller than in these United States. Let me just quote what a bandit murderer said to me in a state where capital punishment is legal: "If you have to kill a guy in the course of doing your work, the chance are four to one that you won't get caught. If you are caught, the chances are two to one that you won't be convicted. If you are convicted the chances are four to one that you won't get hanging. And if you do get hanging, the chances are four to one you'll get a commutation to life, before you're hung, and if you get a commutation, you'll serve less than ten years if you behave yourself in prison." And he knew his statistics in this particular state. If that is using capital punishment as a deterrent, we have changed the meaning of the word "use." We must see to it that the crime of murder is treated properly to protect society from the gun man.—Rev. Don Frank in *Quarterly of American Interprofessional Institute,* June 1930.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

EDWARD JENNER AND THE DISCOVERY OF SMALLPOX VACCINATION. Louis H. Roddis, Lieutenant Commander, Medical Corps, U. S. Navy. 155 pages. Illus. Price $1.00. Reprinted from The Military Surgeon. Menasha, Wis.: The Collegiate Press, George Banta Publishing Co., 1930.

MEDICAL AND SURGICAL YEAR-BOOK. Physicians Hospital of Plattsburgh, N. Y. 322 pages. Illus. Price $3.50. Plattsburgh, N. Y.: The William H. Miner Foundation.

CLINICAL LABORATORY METHODS (Third Edition). Russell Landram Haden, M.A., M.D., Professor of Experimental Medicine, University of Kansas, School of Medicine. 317 pages; 69 illustrations and 4 color plates. The C. V. Mosby Company, St. Louis, 1929.

As a former laboratory director and teacher in clinical microscopy and later a research man and internist, the author is peculiarly fitted to prepare a book of this kind. He claims it to be "in no sense a textbook" but a working manual for the clinical laboratory of a general hospital. The reviewer is impressed with the brief and clear presentation of each procedure without unnecessary discussion, the omission of unimportant and obsolete methods which ordinarily waste pages of like books on laboratory methods and the later and more authoritative references given to each technic to which the student may refer.

The book is manifestly a working guide for a busy clinical laboratory which is fortunate enough to enjoy the full coöperation and patronage of the internist who appreciates the real value of the well executed laboratory aid. As such, this book has a definite and useful place in the reference library of a clinical laboratory.

KANO IKEDA, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

EXPERIENCED LABORATORY TECHNICIAN and nurse wishes position in clinic, doctor's office, or hospital. Address D-97, care MINNESOTA MEDICINE.

WANTED—Locum tenens or assistantship by experienced physician, licensed in Minnesota. Address D-98, care MINNESOTA MEDICINE.

WANTED—1927 University of Minnesota graduate desires permanent location in Minnesota. Has been doing general practice and assisting surgeons since graduation. Age 33. Married. Can arrange interview. Address D-94, care MINNESOTA MEDICINE.

WANTED—Young lady 21 years old wishes position in doctor's or dentist's office. High school graduate, nurse's training, typewriting. Address D-95, care MINNESOTA MEDICINE.

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline, Saint Paul. Rent $25.00 a month. Inquire at dentist's office.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIII OCTOBER, 1930 No. 10

THE USE OF SEVERAL NEW DERIVATIVES OF BARBITURIC ACID*

JOHN S. LUNDY, M.D., and CLAUDE F. DIXON, M.D.
Rochester, Minnesota

AT THE present time derivatives of barbituric acid are considered as valuable drugs for surgical and nonsurgical purposes. Their value has not been wholly determined but most surgeons are agreed that from the standpoint of postoperative complications, small or hypnotic doses are to be preferred to large or anesthetic doses.

Since each of the barbiturates produces a somewhat similar effect,[1] we shall describe briefly the effect of various doses of sodium *iso*-amylethyl barbiturate (sodium amytal) on the average patient. The factors which change the patient's tolerance for the drug obviously cause variations in the effect.

SODIUM *iso*-AMYLETHYL BARBITURATE (SODIUM AMYTAL)

Sodium *iso*-amylethyl barbiturate has been used at The Mayo Clinic in approximately 2,000 cases in the period from April 1, 1929, to April 1, 1930. The conclusions reached are based on 1,712 of these cases. The drug has been used intravenously in 753 cases, rectally in twelve cases, and orally in the remainder. The most common serious untoward results following the use of a barbiturate are pulmonary edema and bronchopneumonia. It is probable that ultimately small doses must be resorted to since these untoward effects seem to be associated frequently with large doses. Pulmonary edema and bronchopneumonia must be treated early by oxygen, or oxygen and carbon dioxide, with or without the intravenous administration of concentrated solution of glucose.

Because of the relationship between dosage and effect in the average healthy adult, the subject of dosage will be taken up under four headings, representing the four stages of effect during and after the administration of sodium *iso*-amylethyl barbiturate.

In the first, or hypnotic stage, nystagmus, some vertigo and a feeling of inebriation will be produced by the administration of 4 to 6 grains (0.24 to 0.4 gm.). From 7 to 9 grains (0.45 to 0.6 gm.) may produce mild mental excitement. The patient usually answers questions readily until 5 or 6 grains (0.3 to 0.4 gm.) have been given. After about 10 to 12 grains (0.65 to 0.78 gm.) the average patient is unable to answer questions. Ordinarily there is no memory for events after this dose.

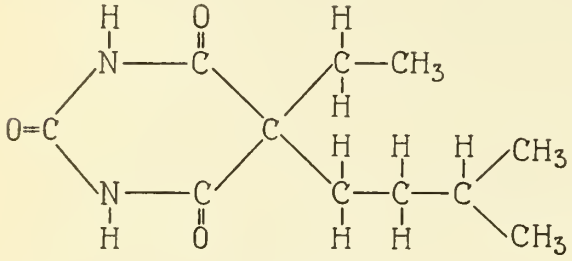
The second stage, that of inebriation, is induced by a dose of from 12 to 16 grains (0.78 to 1.065 gm.). In this stage, the patient responds to painful stimuli. The untoward result in this stage is restlessness.

In the third stage, as the dose exceeds 15 or 16 grains (1.0 or 1.065 gm.) a state of surgical anesthesia begins to develop. In this stage the systolic blood pressure falls from normal to about 90 or 80 mm. of mercury; shallow respiration, slight cyanosis, and a tendency for the tongue to fall back frequently occur. The fall in blood pressure is somewhat proportionate to the rate of injection, in that the more rapid the injection the more rapid the resulting fall in blood pressure. When hypertension is present one may expect about twice as great a fall in blood pressure as when the blood pressure is normal. We find it best to discontinue injection of the drug when

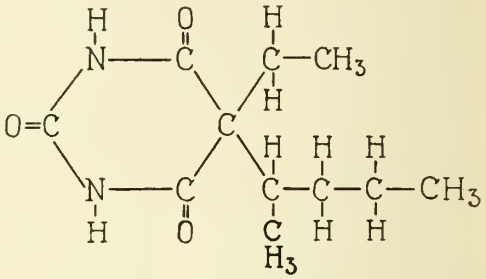
*From the Section on Anesthesia and the Division of Surgery, The Mayo Clinic. Read at the meeting of the Minnesota State Medical Association in Duluth, Minn., July 16, 1930.

the systolic blood pressure has become 85 mm. of mercury or less.

In the fourth stage the dose is between 45 and 100 grains (3.0 and 6.65 gm.). The untoward results incident to the use of various large doses are evidenced by interference with all reflexes.



Amytal



Embutal

Fig. 1. Chemical structure of *a*, *iso*-amylethyl barbituric acid and of *b*, ethyl 1-methyl butyl barbituric acid. One drug is the isomer of the other.

The sequence of events following the administration of this drug is relatively the same regardless of the tolerance which may exist; the proportion between different doses for different stages of effect remains about the same.

Sodium *iso*-amylethyl barbiturate has been used successfully by us as an antispasmodic in convulsive conditions such as tetanus, as an aid to withdrawal of alcohol in postoperative psychosis, in controlling a patient with acute mania, and in one instance for cesarean section. In the last case, the infant cried on being lifted from the uterus. At present this agent is being given to a patient who is dying from an inoperable lesion of the brain, with considerable relief. The patient has required about 3 grains (0.2 gm.) of the drug by mouth each hour for a period of about four months and has consumed, in that time, more than 9,000 grains (600 gm.).

It has been our observation that for the average adult, regardless of age, sex or weight, about one or two hours' noticeable effect for each grain of sodium *iso*-amylethyl barbiturate administered may be expected, especially if other medication has been omitted.

SODIUM ETHYL 1-METHYL BUTYL BARBITURATE (SODIUM EMBUTAL)

From March 4 to July 15, 1930, the sodium salt of ethyl 1-methyl butyl barbiturate (Fig. 1), one of the isomers of *iso*-amylethyl barbiturate was used in 705 cases, intravenously in 114 cases, orally in 575 cases, and rectally in 16 cases. This derivative of barbituric acid is essentially antispasmodic and sedative, and differs from sodium *iso*-amylethyl barbiturate in that there seems to be less delirium incident to its use and that an equivalent effect may be produced with about half as much as with sodium *iso*-amylethyl barbiturate.

Sodium ethyl 1-methyl butyl barbiturate may be used in dilute solution since its potency is high. We have used it in 6.66 per cent solution, 1 grain (0.065 gm.) to 1 c.c. The maximal dose has been 7.5 grains (0.482 gm.). The average dose has been 3 to 5 grains (0.2 to 0.3 gm.) administered in three to five minutes. It seems to be particularly valuable in preparing patients for operation and satisfactory sedation has been obtained regardless of whether the final anesthetic desired is local, general, or both, from the administration of from 1.5 to 4 grains (0.097 to 0.24 gm.) of this agent by mouth, together with 1/6 or ¼ grain (0.01 or 0.015 gm.) morphine sulphate by hypodermic injection, about thirty-five to forty-five minutes before operation.

We have found that in connection with many of the general and local anesthetics a better result may be obtained with the sodium salt of ethyl 1-methyl butyl barbiturate or of *iso*-amylethyl barbiturate than with the other barbiturates we have used, and that less local or general anesthetic is required.

We believe that the morbidity, if not the mortality, incident to the administration of general anesthetics and possibly of local anesthetics may be materially reduced by the use of preliminary medication with these barbiturates. These prep-

arations seem to allay fear, thereby keeping the patient's tolerance normal for the anesthetic that is to be used.

Sodium *iso*-amylethyl barbiturate (sodium amytal) and sodium ethyl 1-methyl butyl barbiturate (sodium embutal) have been very useful in operations on the thyroid gland in that they make it possible for the operation to be done with local anesthesia and without the use of inhalation anesthesia. The patients may be awakened at any time during the procedure and one is able, therefore, to determine immediately if injury has occurred to either recurrent laryngeal nerve.

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SPINAL ANESTHESIA: CONCLUSIONS BASED ON A STUDY OF 1,283 CASES*

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SPINAL anesthesia was used in 2 per cent of the cases of major surgery performed at the Jackson Clinic in 1920; in 1928 the percentage had doubled; in 1929 it had increased to 71 per cent, and for the present year to date this anesthesia has been used in 80 per cent of the major operations.

Previous to 1928 spinal anesthesia was used only in selected types of operations at our clinic, such as prostatectomies and extensive resections of the bowel for malignancy. Although our staff has favorably regarded this form of anesthesia for a number of years, inability to govern the fall in blood pressure has prevented its use as a routine measure. However, the rediscovery of ephedrine by Chen, a Chinese student at the University of Wisconsin, and the demonstration of its action in preventing a fall of blood pressure in spinal anesthesia, as shown by Ockerblad and Dillon in 1927, served to eliminate this objectionable feature.

Meanwhile, through the efforts of Babcock, Jonnesco, Labat, and some of the European surgeons, spinal anesthesia was again winning more advocates. Shortly prior to the 1928 meeting of the American College of Surgeons, Pitkin, among others, called attention to the value of this anesthetic in routine major surgical operations performed below the clavicles. Such interest was aroused in this procedure that a considerable portion of this meeting held at Boston was given over to a demonstration and discussion of its advantages and disadvantages. Considerable apprehension was aroused because of a death that occurred at one of the clinics, and there were reports of several other fatalities that directly or indirectly might be attributed to the anesthetic. The literature of the past contains similar reports, but in the light of our present knowledge few if any of these deaths would occur.

Pitkin's demonstration of the ease and rapidity with which spinal anesthesia could be administered caused me to visit his clinic and observe the use of this anesthetic as a daily procedure. His method was introduced into the Jackson Clinic and tried for several months, but proved to be successful in only about 75 per cent of the cases. It was frequently necessary to complete the operation under general anesthesia. Unfamiliarity with Pitkin's methods possibly accounted for some failures. For the past year and a half a volume control technic, which will be demonstrated by Dr. Stout, with moving pictures following this paper, has been used. This method in which the novocaine crystals only are used, following a preliminary injection of ephedrine, has proved entirely satisfactory. It is used in all major operations performed below the clavicles, and has proved so successful that inhalation anesthesia has been discarded almost entirely save for certain minor operations and for lesions about the face and mouth in which local anesthesia is not satisfactory. We have used general anesthesia in less than 2 per cent of our cases in a series of 1,500 thyroidectomies.

COMPARISONS

In spite of the fact that spinal anesthesia has gained tremendous popularity in the past two years, it is still looked upon with considerable skepticism by many surgeons who are unwilling to give up the old established methods. Probably there is no group of individuals as hard to convince of the merits of a new procedure as the medical profession. Possibly this is the result of frequent failures following too exaggerated claims.

Ether has been the old reliable anesthetic so long and the one that could always be relied upon that it naturally will be the last to be abandoned. It is looked upon as a comparatively safe anesthetic and, as far as deaths upon the operating table are concerned, it undoubtedly is. Little account, however, is attached to the mortalities that

*From the Jackson Clinic, Madison, Wis. Read at the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 16, 1930.

occur days or weeks later as the indirect result of ether complications. Certainly in our experience, while complications still occur, they do so considerably less frequently after spinal than following ether anesthesia. Our statistics indicate a considerable decrease in the number of postoperative sequelæ occurring from the fifth to the fifteenth day, such as acute dilatation of the stomach, ileus, pneumonia, and embolism.

CHART I

ANALYSIS OF 1,283 OPERATIONS PERFORMED UNDER SPINAL ANESTHESIA

Appendectomies	277
Cesarean sections	22
Cholecystectomies	97
Cystoscopies	120
Gastric and intestinal operations	72
Herniotomies (all types)	89
Laparotomies	39
Orthopedic (leg, hip, spine, etc.)	59
Pelvic	352
Prostatectomies and cystotomies	40
Radical breast amputations	8
Rectal	44
Miscellaneous	64
TOTAL	1,283

Nitrous oxide is an ideal anesthetic for short operations, but it does not afford the relaxation in major abdominal surgery that is obtained with spinal or even ether anesthesia. Furthermore, it so increases congestion and venous stasis as to frequently obscure the field of operation.

Along with many other clinics we have abandoned the use of ethylene because in our judgment it is incomparable as an anesthetic to local or spinal anesthesia, and because the surgeon should not be burdened with the responsibility of a possible explosion.

During the past year several other new anesthetics, or one might better say hypnotics, have received considerable attention. Of these sodium amytal has probably been the one most widely discussed and used in this country. Shortly after Zerfas and McCallum first reported the use of this drug, I had an opportunity of visiting their clinic and observing the effect of sodium amytal. The initial impression I received from observing the spectacular effect of a child going quietly to sleep within three minutes after the intravenous injection of the drug, was even greater than when I first observed Pitkin performing an open reduction of a child's femur under spinal anesthesia. After a year's study with sodium amytal in comparison to spinal anesthesia, however, I have come to the following conclusions:

With sodium amytal the patient is either unable to comprehend and coöperate, yet not sufficiently asleep to permit operating without the aid of nitrous oxide, or he is so deeply asleep that one is rather uneasy concerning his condition, while under spinal anesthesia the surgeon at all times has the patient's coöperation.

With sodium amytal it is impossible to have the patient cough or strain, frequently a valuable aid in doing a herniotomy. The addition of nitrous oxide causes the operating field to become more vascular and the risk of pulmonary complication is introduced.

CHART II

	1928 Aug. 1 to Dec. 31	1929 Jan. 1 to Dec. 31	1930 Jan. 1 to May 31
Operations in which spinal anesthesia was possible	342	1,253	498
Number given	79	893	346
Percentage	21	71	80

Delirium is frequently present so that the patient requires constant attention for hours following operation, an objectionable feature that is absent with spinal anesthesia.

In abdominal and pelvic operations relaxation is better than that obtained under inhalation anesthesia, but incomparable with that obtained under spinal anesthesia.

These comparisons are given in detail because at a number of meetings I have attended recently those present have been interested in the relative merits of these two methods of introducing anesthesia. Experience with sodium amytal was wisely limited to a small number of investigators by Zerfas and McCallum during the early months of trial. In spite of their precautions several fatalities may be directly or indirectly attributed to its use.

I have reached the conclusion that while sodium amytal will prove valuable, particularly as a hypnotic and as an anesthetic in certain operations about the face and mouth requiring the use of cautery, for major surgery, spinal anesthesia is greatly preferable. My observations on the use of avertin or tribromethanol, and pernoctin are limited, but in comparison with spinal

anesthesia I believe the same objections may be considered as with sodium amytal.

ADVANTAGES

In my opinion the introduction of spinal anesthesia into the daily operating routine is the greatest boon, not only to the surgeon but to the patient as well, that has taken place since the advent of aseptic surgery. The advantage to the patient is tremendous. If the operation is performed with average skill and within reasonable time the patient returns to his room almost as well as when he went to the operating table. Instead of being unconscious or even semiconscious with all the cells of the body drugged and the heart and lungs overtaxed, he is able to smile and talk to nurses and relatives. It is not unusual for the latter to be more perturbed than the patient. To prove how little the patient is affected by an operation we have even permitted a few to read or smoke.

From the hospital standpoint the problem of the after-care has been greatly simplified by the elimination of postoperative vomiting and unconsciousness. Relatives no longer spend anxious hours waiting for a patient to awaken from a prolonged inhalation anesthesia after a long operation. Fluids may be taken by mouth during and after the operation. There is no troublesome mucus in the throat, which is frequently present after an inhalation anesthetic. Since there is no retching or vomiting and consequent strain upon the wound, the patient suffers less postoperative discomfort and pain. Postoperative gas pains and distension are lessened because the intestines need not be forcibly walled off by sponges and handling.

The surgeon profits greatly. He is free from the worry of the ever-present danger of explosion. While close observation must be kept of the patient's condition, particularly as regards his blood pressure, yet there is less danger of sudden cessation of respiration than with nitrous oxide. Such occurrences are unusual in the experience of expert anesthetists, but the average hospital does not retain such highly trained anesthetists. If the blood pressure continues to fall after a spinal anesthetic in spite of the preoperative administration of ephedrine and adrenalin the repetition of either one or both of these drugs will control the situation.

As far as operative technic is concerned the surgeon's difficulties are immeasurably decreased. The abdominal wall, instead of being tight and rigid, is relaxed and the peritoneum can easily be lifted. When the latter is incised, the intestines do not well up into the wound but remain quiet and contracted, greatly simplifying the removal of a gangrenous or ruptured appendix or gallbladder, the release of an intestinal obstruction, or the anastomosis of the stomach and intestine. It is, of course, much easier to reach the source of trouble and eliminate it under these conditions. Closure of the wound is simplified by the relaxed abdominal muscles. Spinal anesthesia tends to eliminate the necessity for undue haste in any operation, since the patient suffers little shock. Patients stand long, critical operations far better under spinal anesthesia.

Some patients object to being awake during an operation, and it is simple enough to dull their sensations with the use of scopolamin and pantopon.

CONTRAINDICATIONS AND COMPLICATIONS

Spinal anesthesia is not devoid of danger if improper technic is followed, but we believe that fewer complications occur than with general anesthesia if the correct methods are used. In our first thousand cases there were no deaths which in any way could be traced to spinal anesthesia.

No patient has been refused this anesthesia during the past two years for any major operation performed below the clavicles. Cases of hypotension may be controlled by ephedrine. Central nervous system diseases such as brain tumor, or meningitis, neuro-syphilis, shock, and marked cardiac decompensation may be considered as contra-indications for spinal anesthesia.

Early in this series a number of postoperative headaches occurred, but with improvement in technic as developed by Stout and with the use of a small 22 gauge needle this objectionable feature has been almost eliminated. Postoperative pneumonia occurred in only three cases, although it was frequently necessary to perform emergency operations in the presence of acute respiratory conditions. Temporary paresthesias occurred in four cases among the first 1,000 patients, but have not occurred since. No permanent disability or lesion has resulted. The use

of ephedrine or adrenalin will check the fall of blood pressure and consequent nausea; carbon dioxide is a useful adjunct.

No attempt has been made in this discussion to cover the subject of technic which has been developed through the efforts of Labat, Jonnesco, Pitkin, Babcock, Koster and Stout. The latter in particular has done splendid work.

I wish merely to show the great satisfaction which we have obtained from using spinal anesthesia in our daily operative experience in the past two years. We are convinced that it is not a transient fad, as the experience of others as well as ourselves has shown it to be the most satisfactory anesthetic when properly used.

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EYE, EAR, NOSE, AND THROAT ANESTHESIA*

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AS in operations in other fields, anesthesia for the eye, ear, nose, and throat may be divided into general and local. The technic of anesthesia in general is so amply covered in this symposium that it will not be taken up in this discussion. We will endeavor to bring out such modification as necessary for these special fields and to give the members of this association the results of our experience and conclusions drawn from the administration of anesthesia, both general and local.

GENERAL ANESTHESIA FOR THE EYE

Operations in the field of ophthalmology are so generally performed under local anesthesia that the subject of general anesthesia will need only brief discussion. There are times, of course, when any operation on the eye—cataract alone excepted—must be performed under a general anesthetic and in these rare instances ether is the anesthetic of choice. For short operations gas-oxygen anesthesia is used by preference. We use general anesthesia for small children and occasionally at the request of the patient having such major operations as enucleation. By use of a preliminary hypodermic of morphine even the "nervous type" of patient will usually be operated quite satisfactorily under local anesthesia. On account of the location of the work, special technic has to be used to keep the field sterile. After the patient is sufficiently under the anesthetic, the face is prepared and covered by sterile towels and gauze. The anesthetist may then render himself sterile or give the anesthetic while keeping himself well outside of the field of operation. This we accomplish by having the operator's assistant manage the head while the anesthetist uses a sterile towel so folded to fit over the nose, the remainder of the towel acting as a handle to the improvised cone.

LOCAL ANESTHESIA FOR THE EYE

We now limit our use of local anesthetics in the eye to the five following drugs: Cocain, butyn, novocain, holocain, and dionin. There have been introduced at various times numerous substitutes, such as eucain, acoin, stovain, alypin, and others. Our experience is that there are no real substitutes for the first five named.

Cocain is, of course, the outstanding anesthetic in ophthalmology. This is generally used in two and four per cent solutions. A drop of 4 per cent cocain every four minutes, for four or five instillations, will suffice for the average intraocular operation. Where there is congestion, sufficient adrenalin is used to counteract it. In operations on the globe, one drop of adrenal extract is usually sufficient. A 10 per cent solution of cocain is always kept on hand and is used in rare instances where the eye remains sensitive after the use of the 4 per cent solution. The 10 per cent solution is also valuable in strabismus operations to instill along the muscles after the conjunctiva is open and before manipulation of the muscles has begun. For injection for local anesthesia about the eye, we use 1 per cent cocain solution containing three to five drops adrenalin and use this for all purposes where no more than 1 c.c. of solution is required. This is particularly adaptable for extirpation of the lacrimal sac and plastic lid operations of minor degree.

Where infiltrations are made, novocain is used in place of cocain and in solutions from 1 to 2 per cent. For infiltration of any extent for plastic work, 2 per cent novocain solution is used in conjunction with the usual amount of adrenalin. Where large absorption may be expected, such as local anesthesia for enucleation, we use 1 per cent novocain with adrenalin.

Holocain in 1 per cent solution is used routinely only to anesthetize the cornea before taking readings of intraocular tension.

Butyn, in 2 per cent solution, we have found to be a very useful local anesthetic in office practice, for foreign body removal, and for minor operations upon the surface of the eye.

We have found dionin very useful for pain and irritation, particularly where the inflamma-

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tion is deep-seated and subacute or chronic. In cases of low grade iritis or uveitis, the patient is given a 2 per cent solution of dionin and instructed to use one drop three times daily in the painful eye. There is first an inflammatory reaction, followed by analgesia which may last for several hours. The eye establishes an immunity so that the strength of the solution is increased with each subsequent one-dram prescription. In some cases this may reach 10 per cent.

GENERAL ANESTHESIA FOR EAR, NOSE, AND THROAT

Ether is used for children under twelve, and occasionally is necessary for adults. With rectal or intravenous administration we have not had experience. We believe that gas-oxygen anesthesia for tonsillectomy has no place.

LOCAL ANESTHESIA FOR THE EAR

For anesthetizing the ear drum or skin of the external canal, we use a mixture of equal parts of cocain, phenol, menthol, glycerine and alcohol. A pledget soaked in this solution is left in the canal for fifteen minutes. This is suitable for polyps of the middle ear, and furuncles of the canal. For paracentesis of the drum, it is not reliable, and we prefer gas-oxygen anethesia.

LOCAL ANESTHESIA FOR THE NOSE

For all intranasal work, we use block anesthesia. Cotton applicators are soaked with cocain flakes moistened with adrenal extract. Two are inserted up to the roof of the nose, parallel to the outer slope. This blocks the anterior nasal nerve. Another pair are pushed back to the posterior tip of the middle turbinate to block the sphenopalatine ganglion. Before inserting these, the nose is sprayed lightly with a two per cent solution of cocain alternating with a 1:2,000 solution of adrenal extract. The anterior applicators must be made very thin, otherwise there is difficulty in finding room for them.

We believe this method has every advantage over the method of direct application of cocain solutions to the mucous membrane. Certainly there is less absorption of cocain, because of the small area involved. In septum operations, there is no trauma to the septal mucous membrane.

LOCAL ANESTHESIA FOR THE THROAT

For tonsillectomy, we think that cocain has no equal. We use eight c.c. of a 0.2 per cent solution, with twelve drops of 1:1,000 solution of adrenal extract added just before injection. This mixture gives a more certain anesthesia than novocain. Also, there is decidedly less bleeding. The occasional failure of novocain and similar drugs to produce a complete anesthesia in tonsillectomy is injurious to one's reputation.

The addition of the adrenal extract is all-important. The only poor results we have had were when we used adrenal extract not sufficiently fresh. Twelve drops may be more than is usually used, but we believe that this quantity assures freedom from absorption of cocain.

Our method of preparing the solution is as follows: a 4 per cent stock solution of cocain is made and kept about two weeks before use, when it will be sterile from starvation of any organisms that may be present. In order to assure relatively sterile precautions, we make this solution ourselves in the office. It is made up in camphor water to keep out fungus growths. In the operating room this is diluted with sterile salt solution, first to one per cent, then to two-tenths per cent.

Over a period of thirteen years we have had no disturbing, toxic effects from cocain in tonsillectomy.

CONCLUSIONS

1. Local anesthetic is the anesthetic of choice in eye, ear, nose and throat operations.
2. Cocain remains the most important anesthetic.
3. No undesirable results have been observed from cocain combined with adrenal extract when exhibited in proper dosage.

THE ANESTHESIA PROBLEM AS RELATED TO LOCAL ANESTHESIA*

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FOR many years we have been bombarded with that euphonious term "selective anesthesia." The idea of the "selection" of the exact type of anesthesia from among the many excellent methods (individual and combined) that are now available, is so intriguing, that it is small wonder that he who advocates such a routine finds his audience properly attuned and in thorough agreement with his suggestions.

When, however, one visits the various clinics throughout the country and critically observes the methods being followed, he will find as a rule that, except in rare instances, every surgeon or group of surgeons is apt to be "wedded" to *one* or seldom more than *two* types or methods of anesthesia. The fact is that most surgeons use the method which, in their hands, or under their surgical environment, gives them the greatest satisfaction. The term "environment" is used advisedly as it is believed one's surgical environment or his special training are the most frequent causes for choosing any particular type of anesthesia. Those in control of the institutions in which they operate may choose the anesthetic, but the majority of surgeons are under no such control. Thus many surgeons are not exactly free agents. Furthermore, the anesthetic which is the *safest* in one institution is not necessarily so in another.

A certain percentage of institutions are so equipped that many methods may be tested out and compared. Unfortunately, such institutions are in the minority. Likewise, as a rule, surgeons are prone to accentuate the advantages of the particular anesthetic they are using. This is but natural. These considerations must be taken into account when evaluating the merits of the various types of anesthesia, as few surgeons are so fortunate as to be able to test them individually and give unbiased opinions. There may be a "best" anesthetic for every individual case, but the difference in opinion regarding it is apt to be influenced by the above-mentioned factors. Every known anesthetic has both advantages and disadvantages and many of the former are directly due to the excellence of technic of administration.

Probably no anesthetic possesses such outstanding qualities that it should be used quite universally and yet it is probably true that certain individuals or groups may use *one* method to the exclusion of all others with an increased margin of safety.

In choosing an anesthetic, two of the above points must be kept in mind: The surgeon's ability to bring to his patient *safe* general anesthesia, or to use the "local anesthesia method" *safely, skillfully* and *successfully*. To the writer's mind, this amounts to employing "selective anesthesia" in the superlative degree.

Obviously, if a surgeon is not properly equipped to offer to his patients the greatest safety, comfort and efficiency with local anesthesia, some other type should be used. In the final analysis, therefore, it is, as a rule, not the *anesthetic* so much as the *anesthetizer*, that counts in the choice of an anesthetic.

The writer believes that the frequent disagreements regarding local anesthesia have occurred because the spoken term meant one thing in some instances, and in others something else again.

For instance, if one were able to perform a hysterectomy or a cholecystectomy or reduce a fracture† as satisfactorily under local anesthesia as the excision of a small skin tumor, all would agree, perhaps, that "selective anesthesia" would indicate its use for these major procedures. There should, therefore, be no objection to this choice if made by one who *can* accomplish this feat. And yet it is those who *cannot* accomplish this feat who offer the objections to the use of local anesthesia in just such instances. Is it not possible that we have been conversing in different languages? That those who have not mastered

*Read by Dr. W. N. Graves at the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 16, 1930.

†For over twenty years the writer has reduced more than 98 per cent of his fractures under local anesthesia. Muscular relaxation is one of the outstanding results of this method.

the art of local anesthesia for major surgery, have "selected" some general anesthetic on this account? For those who *can* employ this anesthetic satisfactorily in certain operations, should it not be the one of choice? Is not this often the real point of controversy between those who favor general over local anesthesia and vice versa? Is it not a fact that when one listens to speakers upon this subject, he should consider *who* is doing the speaking and exactly the type of work the speaker is capable of doing? Must it not be admitted that in certain hands *local* anesthesia is the one of choice, while in others—especially those who have access to ideal general anesthesia, and have not mastered the technic of local anesthesia—the "selective anesthesia" of choice should be *general* anesthesia?

When the profession realizes and admits these facts there will be far less controversy concerning the subject of anesthesia. One longs for the day when *all* will use the *same language* when speaking of anesthesia—especially *local* anesthesia.

There are surgeons who: (1) can employ local anesthesia ideally in a vast percentage of all types of cases; (2) can obtain ideal general anesthesia; (3) cannot give local anesthesia well and can only poorly control the administration of general anesthesia.

Obviously, these three classes of surgeons—and they merge into one another—look upon the subject of anesthesia from different viewpoints. Provided what the writer has said is true, their varying viewpoints are easily explained and understood. The most desirable "selective anethesia" is that which, in the hands of the surgeon who performs the operation, gives the patient the greatest protection and comfort—at the same time permitting the best opportunity for meeting the indications. For a particular operation, local anesthesia may be *ideal* in the hands of one surgeon and a *fiasco* with another.

A number of years ago, the writer took part in a symposium before the American Association of Anesthetists. One speaker (an Englishman) asserted that chloroform was the anesthetic of choice and "proved" his point by mentioning the shortcomings of all other anesthetics. We then heard extolled the advantages of ether, nitrous oxid, nitrous oxid and ether, nitrous oxid and local, ethylene, spinal, and finally the writer attempted to explain wherein they were *all* wrong and that *local* anesthesia was usually the method of choice. Paradoxical as it may seem, we may *all* have been right—under certain circumstances, while under others, we *all* may have been wrong. The writer believes that this is the crux of the anesthesia problem today.

A few words regarding local anesthesia may be apropos. There are three distinct methods of applying this anesthetic and the writer believes that local anesthesia has no successful competitor when the all-important question of safety is considered; and when all is said and done, *safety* is the factor which is of the greatest importance. The three methods are as follows:

1. Spinal or intradural.
2. Regional or conductive.
3. Infiltration or infiltration block.

The subject of spinal anesthesia has been ably considered by our guest, Doctor Jackson.

The *regional* is the ideal method of applying local anesthesia, in instances in which it applies. as in intercostal, sacral, trigeminal, brachial and occasionally in the extremities. While ideal when indicated, its field of application is somewhat limited and the failures of novices who attempt to follow the teachings of the experts have done more to retard the use of local anesthesia than have the so-called "extravagant claims" of those who have mastered the technic of local anesthesia.

The third method, *infiltration* anesthesia, has by far the wider field of application and its technic is more simple, more easily taught and acquired and gives a higher percentage of success than does regional. It is the writer's belief that when surgeons master the technic of infiltration anesthesia and the *surgical technic necessary to make it a success,* local anesthesia will be more widely accepted.

Of course we shall always be confronted by that ephemeral specter, "psychic shock." And yet if the entire public were convinced that they were being operated upon in the *safest* possible manner and fully believed this to be the ruth, one wonders how great a part psychic shock would play. It is significant that reports of excellent results following sacral anesthesia combined with suprapubic infiltration with novocain, for the operation of prostatectomy, are now coming from the very clinic that has stressed the dangers of "psychic shock" to the *n*th degree. One wonders why patients with enlarged prostates

are not also victims of psychic shock as well as other classes, yet this factor is ignored in these reports. Aside from exophthalmic goiter, psychic shock should play as great a rôle here as in any type of surgery. The same is true in hernia.

The writer, after operating upon several thousand conscious patients, must confess his inability to recognize this entity—provided the patients were properly handled before, during and after operation and were not compelled to suffer *pain.*

As a good example, we might even take the bad case of exophthalmic goiter. Why is it that these patients often lie quietly during the induction of local anesthesia (provided this is made painlessly) and the early steps of the operation, only to "go to pieces" or show what the writer presumes is "psychic shock" when the gland is mobilized and the "deep" portion of the operation is being carried out?

The writer believes that it is due to failure to obtain *complete anesthesia* of the *deeper structures.* He has consistently operated upon these patients, sending them back to bed with a slower pulse, and apparently in better condition, than before operation—except when he failed to obtain complete anesthesia, or was guilty of committing some other surgical or psychic insult to the patient. Pain, unnecessary noise, traction, choking, pressure, an uncomfortable position, or some other type of insult have been the usual reasons for trouble in all types of cases.

In conclusion, the writer wishes to stress the following points:

The patient is entitled to the anesthetic that gives the acme of *safety, comfort* and *efficiency* of operation.

"Selective anesthesia" is frequently a misused term.

The surgeon's particular *environment* is closely associated with the choice of an anesthetic, and this is a far more important criterion than the particular type of anesthetic employed.

It is not nearly so important to select the drug as to know *by whom* it is to be administered—*and how!*

Local anesthesia, properly administered and accompanied by the necessary *finesse* in surgical technic, is the *safest* anesthesia yet discovered.

Patients' fear is, to a large extent founded upon reports of the improper use of local anesthesia.

So-called "psychic shock" as a result of operating under local anesthesia is, as a rule, a manifestation of *pain* or *errors in local or surgical technic, or management of the patient.*

In the writer's experience, thousands of completely conscious patients of all ages have not shown this complex, when handled ideally and properly managed and operated upon *without pain.*

Infiltration anesthesia (except when regional is indicated) is the local method of choice and if properly injected and reinforced by special surgical technic and ideal psychic management will, in trained hands, permit the ideal performance of a wide range of operations.

Under the requisite environment, "selective anesthesia" will point to local anesthesia as the method of choice in a vast percentage of operations, both minor and major.

When choosing any anesthetic we should "select" its *best* fruits—not its *abused technic*—as our *standard.*

In choosing an anesthetic, the *drug* is secondary in importance to the *anesthetizer,* and when using local anesthesia, the *type of surgical* technic may be, and frequently is, more important in insuring a successful issue than the local anesthesia technic.

LOCAL ANESTHESIA*

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THE past ten years has seen a very great tendency towards other methods than general inhalation anesthesia. The use of intravenous and spinal anesthesia has increased rapidly in popularity. However, the writer feels that there is no contest between the various methods of producing anesthesia but that the choice should rest with the judgment of the operator as to the type of anesthesia to be employed in any given case. In the healthy, robust individual, almost any anesthetic will suffice; but in the seriously ill, profoundly toxic, or substandard risk, local anesthesia is undoubtedly still the safest procedure. We believe that the profession as a whole prefers to avoid general anesthesia if possible, and even the most ardent advocates of spinal anesthesia warn against its use in the profoundly toxic patient.

In the recent advances in the surgical treatment of acute nephritis, local anesthesia plays an important part. Here again we are dealing with the critically ill patient and the anesthetic is of vital importance. For more than sixteen years we have used some type of local or regional anesthesia in the treatment of fractures. We have repeatedly used the brachial anesthesia for arm and forearm fractures, and infiltration directly into the site of fracture when this type of anesthesia is indicated.

We personally watched Babcock perform, under local anesthesia, a colostomy on a long standing intestinal obstruction with severe toxemia and fecal vomiting, and operate upon another patient with a ruptured appendix, peritonitis and a secondary abscess, causing an intense toxemia.

Matas states that as a rule he never resorts to spinal anesthesia in weak, exhausted and hypotensive subjects. We would quote Labat as follows:

"The wholesale use of spinal anesthesia should be discouraged and its application throttled down to surgical necessities. Its simplicity of technic and clinical advantages over all the other methods of anesthesia have served in the past to stimulate its routine administration by the inexperienced. It was given to all classes of patients for all types of operations."

Although Koster states that he has not had a fatality attributable directly to spinal anesthesia, nevertheless he reports four fatalities as possibly having been contributed to by spinal block. One was an old man with obstruction, the second a diabetic with spreading gangrene, the third a child of six with obstruction from Meckel's diverticulum, and the fourth a suppurative peritonitis with myocarditis. If we are to judge by the teaching of many, these are the cases not suitable for spinal anesthesia.

The writer has repeatedly used other forms of anesthesia and believes firmly that one must not be wedded to one type of anesthesia to the exclusion of all others. In other words, we agree explicitly with Matas when he states that in the matter of anesthesia one should be selective and eclectic and not a routinarian.

After all, is it not true that one of the greatest factors leading to the success of local anesthesia is that the surgeon cannot traumatize tissue with impunity? He cannot, for instance, pull upon the abdominal viscera and maintain a negative intra-abdominal pressure. By demanding far greater respect for the tissues and a much more painstaking and refined technic, local anesthesia helps to prevent shock and affords a less stormy convalescence. We have used local anesthesia alone; with morphine and scopolamine, hypodermically (Farr's narcolocal anesthesia); likewise with gas to produce the anoci-association of Crile; and we have also repeatedly used it in conjunction with spinal anesthesia. We have seen surgeons operating with an incomplete spinal anesthesia, the lower abdomen, for instance, being completely anesthetized, but the anesthesia in the upper abdomen being incomplete, requiring the additional administration of gas or ether. We have likewise seen and experienced the waning of perfect spinal anesthesia due to a prolonged surgical operation in which general anesthesia had to be added. We have

*Read at the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 16, 1930.

found, however, that the addition of splanchnic block to the stomach or gallbladder and an infiltration of the sensitive portions of the abdominal incision have permitted us to complete a much drawn out surgical operation in which the spinal anesthesia waned or was incomplete. We would strongly recommend the use of local and splanchnic anesthesia under such circumstances.

Novocain has been so efficient, so free from danger, and of such minimum cost, that it has been almost universally accepted for local anesthesia. Many newer drugs have arisen, but until it is proven that their advantages supersede those of novocain they should not be substituted. Solutions of 1 per cent for infiltration anesthesia and 2 per cent for nerve blocking have, in our hands, proven most efficient. Solutions should be prepared in large quantities from accurately weighed novocain crystals, rather than from the tablets, which are more expensive and less likely to be sterile. Adrenalin, in quantities from two to three minims per ounce, prolongs the anesthesia, reduces absorption and likewise toxicity. This addition is best avoided in cases of hyperthyroidism.

Regional anesthesia and nerve blocking are far more difficult and in most instances possess no advantages over straight infiltration and infiltration block anesthesia. Because of its greater simplicity, the ease of its induction and the fact that it carries a much higher percentage of success, infiltration anesthesia, when indicated or combined with blocking, is much more practical in the hands of the general practitioner and the general surgeon. We believe that it is extremely important that the anesthetic solution be injected by the operator and there are now scattered throughout the country many excellent surgeons in small clinics, where the general anesthetist is not so well trained, who are doing the greater portion of their major surgery under local anesthesia.

It is needless to say that proper equipment is paramount; good syringes with fine needles cannot be displaced by leaky syringes with poorly fitting, dull aspirating needles. One must constantly bear in mind that the patient who is awake may soon become uncomfortable and object more to his position upon the table or the binding straps upon the arms than to the operation itself, and his comfort is an important consideration.

General Technic.—The technic of local anesthesia and local anesthesia combined with infiltration block is so simple that it can be used by any surgeon who is willing to master its details. If the injecting needle is always kept in motion and the solution projected ahead of the needle, the advance of the needle will be painless and safe. If, however, the needle is plunged into the tissues without the solution being projected ahead of it and a large injection made with the point of the needle stationary, the procedure will be painful and may be dangerous if the point of the needle should penetrate a vein. It has been advanced that this explains the fatalities from local anesthesia in throat operations, where a very fine needle may easily be plunged into the venous plexus behind the tonsil and an intravenous dose administered.

Technic of Injection.—A very fine needle is used to make the primary wheal at the edge of the operative field. From this wheal, secondary wheals are made by bringing a longer needle into the skin from below. In this manner all secondary wheals are made painlessly. The patient should feel in the skin only the first needle prick and not a succession of wheals, as illustrated in a recent textbook on umbilical hernia, which only causes loss of confidence in method. When it comes to anesthetizing the abdominal wall through the primary and secondary wheals the underlying layers have been thoroughly infiltrated. Similar infiltration of the line of incision together with the blocking of the ilioinguinal and iliohypogastric nerves and a subsequent block of the genital branch of the genito-femoral, when the cord is uncovered, is adequate for the repair of any inguinal hernia. The same method applies to work upon the extremities when, for instance, the leg is circumscribed and an infiltration block is made of the nerve trunks, rendering everything distal to the point of injection completely anesthetized. By this procedure we have been able to treat fractures by the open or closed method, to perform amputations, etc. The same infiltration whether circumscribing the thyroid gland or, as we now usually do, infiltrate radially from a central puncture in all directions, combined with a blocking of the upper cervical nerves on both sides, will permit a painless removal of even the most difficult substernal thyroid. It is a wonderful comfort to the surgeon to have a patient talk during a thyroidectomy and

know the recurrent laryngeal nerves have not been injured. In the scalp or in the thorax, infiltration and infiltration blocking permit painless trephining or thoracoplasty. Infiltration along the line of incision and blocking of the lower four thoracics will permit delivery of the kidney and exposure of the pedicle, which itself may be readily infiltrated after it has been exposed. Nephrotomy by this technic is comparatively simple; nephrectomy is more difficult.

By the use of the infiltration technic as described, the abdomen may be opened with an entirely negative intra-abdominal pressure and without any expulsion of the abdominal contents. At this point, one must be resourceful in the examination of the various viscera through inspection rather than by palpation. With forceps or retractors, the abdominal wall is lifted, permitting the division of adhesions and the visualization of the gallbladder through a lower abdominal incision. In the Trendelenburg position, with vertical retraction, the pelvic organs may be visualized without the use of gauze packs. No attempt should be made to perform any intra-abdominal operation beyond this point without the addition of splanchnic anesthesia. This is probably the greatest step in the advancement of this method within the abdomen. With the colon and the omentum lifted upward, one may block the greater portion of the splanchnic nerves at the base of the transverse mesocolon, or segments of bowel only may be anesthetized. The appendix or the entire cecum and terminal ileum may be blocked or by following the posterior peritoneum at the brim of the pelvis, all of the splanchnics may be intercepted as they descend to the pelvic organs. When the uterus is free a local splanchnic blocking of both the broad and round ligaments and the peritoneum about the cervix will permit a painless hysterectomy. Likewise a local splanchnic blocking about the gall bladder and the peritoneum over the ducts will permit all types of operation in this location. We have removed the entire stomach, resected large portions of the colon, removed the gallbladder and performed the abdomino-perineal Coffey operation for cancer of the rectum by this method with entire satisfaction, even in some patients who were markedly substandard risks.

In conclusion, let me again state that we do not advocate the sole use of any type of anesthesia, but we firmly believe that local anesthesia has a definite field in all types of surgery and particularly in the substandard risk. We would also strongly recommend local anesthesia as an adjunct to incomplete or waning spinal anesthesia.

PULMONARY COMPLICATIONS OF GENERAL ANESTHESIA*

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I HAVE been asked to discuss general anesthesia with particular reference to its complications and have chosen to omit the gastro-intestinal, renal and general chemical complications such as acidosis and to consider for the purposes of this paper only pulmonary complications.

Just a few words about the explosion hazard. This is really a pulmonary complication, as death occurs from explosion within the lungs. With the use of the modern gases and apparatus there have occurred several disastrous or fatal explosions. Although ethylene is a most excellent anesthetic it has been discarded in many localities on account of its reputation, and yet in one or two places where accidents have occurred this gas is still used.

In the Journal of the American Medical Association of March 29, 1930, the Council on Physical Therapy of the A. M. A. published the report of its Committee on Combustible Anesthetics written by H. B. Williams of the Department of Physiology of Columbia University. He carefully reviewed the physical causes of explosions and outlined the precautions necessary to avoid ignition, some of which are practically impossible of general attainment but most of which can be incorporated in a well made apparatus or routinely practiced in well ordered operating rooms. His closing paragraph is as follows:

"Finally, I would state that it is my considered opinion after careful investigation that there is a real and serious hazard in the use of ethylene or ether in modern anesthesia apparatus in which combustible gas or vapor is mixed with oxygen or nitrous oxide and contained in or passed through rubber rebreathing bags or rubber tubing. This hazard is greatly increased by the practice of washing out the apparatus and the patient at the end of the procedure with oxygen-rich mixtures." The whole report is helpfully warning but discouraging.

Rather in contrast to it is the later report published in the A. M. A. Journal of May 10, 1930, by the general A. M. A. Committee on Anesthesia Accidents. This report was drafted by the Chairman, Yandell Henderson of Yale. The committee included Lundy of Rochester, Minnesota, Scott of Rochester, New York, Wells of Chicago, and H. B. Williams of New York, who wrote the former report. This report of course also outlines all the dangers and necessary precautions, but after a survey of upwards of 200,000 ethylene anesthesias, they reach the conclusion that statistically there have not been more than about one explosion death per hundred thousand cases, which is negligible compared with other hazards of anesthesia, and with the advantages of ethylene over all other inhalation anesthetics. I myself feel that all suggested precautions should be met, with the exception of the prohibitory one of the grounded metal strips in the floor, and that ethylene is too valuable to be discarded until a more perfect gas is found.

Pulmonary complications stand out as one of the most important considerations in choosing an anesthetic and are still the paramount cause of post-operative morbidity and mortality.

Graham's recent work, "Surgical Diagnosis," gives figures for pulmonary complications in various clinics that differ rather widely, from .7 per cent in Pittsburgh to 4 per cent in Moscow. A part of this difference may be due to the omission in some series of minor coughs, etc., and complications which arose almost too late to be considered as possibly due to the anesthetic.

We have hurriedly reviewed 1,015 surgical cases at the University Hospitals. This is an unselected group except that nose and throat operations were not included. This is not a large enough series from which to draw very definite conclusions but certain impressions at least can be derived. All these cases were prior to the last four months during which time all patients have been hyperventilated after operation daily for six days.

Table 1 shows 30 pulmonary complications in the 1,015 cases. One patient developed bronchopneumonia on the fourteenth day after operation

*From the Department of Surgery, University of Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 16, 1930.

and recovered. In another patient who recovered, atelectasis occurred on the eleventh day. One patient died on the tenth day, having gastric retention and vomiting as well as bronchopneumonia; one on the fourth day following a perforated appendix having general peritonitis and septicemia as well as bronchopneumonia; one on the twenty-second day after an acute mastoid operation with general septicemia as well as bronchopneumonia; and one died on the twelfth day of bronchopneumonia which did not, according to the records, develop until the ninth or tenth day. One could without much twinge of conscience omit these six cases including four deaths from the list of complications due to the anesthetic. I did have the temerity to exclude one bronchopneumonia death which occurred six weeks after a gastric resection under spinocaine.

TABLE I
ANESTHETICS

		Pulmonary Complications	Deaths
8	Novocaine	0	0
39	Novocaine, Nitrous Oxide	0	0
64	Novocaine, Ethylene	0	0
2	Novocaine, Ethylene, Ether	0	0
58	Spinocaine	0	0
6	Spinocaine, Nitrous Oxide	1	0
7	Spinocaine, Ethylene	0	0
6	Spinocaine, Ethylene, Ether	2	1
120	Nitrous Oxide	2	1
46	Nitrous Oxide, Ether	3	1
205	Ethylene	3	0
117	Ethylene, Ether	4	1
14	Ether, Colonic	0	0
15	Ether, Colonic and Inhalant	1	0
305	Ether, Inhalation	13	4
4	Chloroform	1	1
1015	Total	30	9

Of these four fatal cases, two received ether, one nitrous oxide-ether, and one ethylene-ether. The eleventh day atelectasis and the fourteenth day bronchopneumonia received ether. These will not be referred to again, but please remember charitably in looking at the following tables that these six cases might rightfully be omitted, reducing the nitrous oxide-ether and ethylene-ether pulmonary complications to two and three without a fatality; the ether to nine, with two fatalities; and the total to twenty-four, with five fatalities. In addition to the above, the one death after chloroform was due to bronchopneumonia following resection of the mandible. This seems more probably an operative rather than an anesthesia sequela.

The thing most noticeable in this table is the increase of the figures on the ether lines.

I have made cross reference tables for each anesthetic and for each body region operated upon but have largely consolidated them for this presentation. It will be noted that some of the types of anesthesia had no pulmonary morbidity. These were novocaine and spinocaine alone and with certain additions, 192 operations having been done on various regions under these anesthetics without pulmonary complication. The use of ether seems, according to this table, to increase the incidence of pulmonary complications.

TABLE II
OPERATIONS OUTSIDE OF ABDOMEN, UNCOMPLICATED

		Pulmonary Complications	Deaths
10	Head	0	0
2	Eye	0	0
17	Lip, Palate	0	0
34	Upper Extremity	0	0
28	Kidney, Ureter	0	0
53	Inguinal, Male Genitals	0	0
10	Rectum	0	0
48	Lower Extremity	0	0
6	Spine	0	0
17	Skin	0	0
225	Total	0	0

Now turning to the table on anatomical regions operated upon (Table 2), we see that there are a goodly number of regions where operations show no pulmonary morbidity, regardless of the anesthetic used. Upon these regions (the head, eye, lip and palate, upper extremity, kidney and ureter, inguinal region, male genitals, rectum, lower extremity, spine and skin), 225 operations were performed with various anesthetics without pulmonary morbidity. On the other hand, other regions (Table 3) bear the brunt of the pulmonary trouble. Three hundred ninety-five operations were performed on regions other than the abdomen with three deaths among nine pulmonary complications, while 395 other operations were performed within the abdomen, with six deaths among twenty-two pulmonary complications.

TABLE III
OPERATIONS OUTSIDE OF ABDOMEN, COMPLICATED

		Pulmonary Complications	Deaths
6	Ear, Mastoid	1	1
15	Bony Oral	3	1
156	Neck	2	0
43	Chest	1	1
29	Bladder	1	0
146	Cervix, Vagina, Perineum	1	0
395	Total	9	3

OPERATIONS, ABDOMINAL

		Pulmonary Complications	Deaths
141	Upper Abdomen	15	4
254	Lower Abdomen, Pelvis	6	2
395	Total Abdominal	21	6
1015	Grand Total	30	9

It would seem then that work within the abdomen, and especially the upper abdomen, incurs a greater risk of pulmonary complications than that in other regions.

Each anesthetic was tabulated according to body regions, and each region according to anesthetics used.

TABLE IV

		Pulmonary Complications	Deaths
EAR, MASTOID			
2	Ether Alone	1	1
3	Ether Reinforcement	0	0
1	Without Ether	0	0
6	Total	1	1
BONY ORAL			
6	Ether Alone	1	1
3	Ether Reinforcement	1	0
6	Without Ether	0	0
15	Total	2	1
NECK			
7	Ether Alone	0	0
12	Ether Reinforcement	1	0
137	Without Ether	1	0
156	Total	2	0

Table 4 shows the ear, mastoid, bony oral surgery and the neck. All but one of the five complications and both of the deaths followed ether anesthesia. Neck operations were practically free from pulmonary complications, one case of bronchitis following one of the twelve ether reinforced anesthesias, and one bronchitis following one of the 136 without ether.

TABLE V

		Pulmonary Complications	Deaths
BLADDER			
2	Ether Reinforcement	0	0
27	Without Ether	1	0
29	Total	1	0
CERVIX, VAGINA, PERINEUM			
2	Ether Alone	0	0
15	Ether Reinforcement	0	0
129	Without Ether	1	0
146	Total	1	0

Table 5 shows the operations on bladder, cervix, vagina and perineum, in which no trouble followed the administration of ether. It was given in nineteen of the 175 cases. In operations in this region there were only two pulmonary complications, and these without fatality—a pretty safe region to operate upon, pulmonarily speaking.

Table 6 shows operations upon the chest, upper abdomen and lower abdomen and again shows a much higher incidence in abdominal operations, especially in the upper abdomen, with an additional increase when ether was used. Strangely enough (a thought which had not occurred to me before), the morbidity and the mortality seem to be greatest when ether was used as a reinforcement to some other anesthetic rather than when it was used alone. Following abdominal operation hyperventilation with carbon dioxide on the days following operation produces quite severe pain in the operative field, indicating the reason for shallow respiration following this type of operation.

TABLE VI

		Pulmonary Complications	Deaths
CHEST			
6	Ether Alone	0	0
4	Ether Reinforcement	0	0
33	Without Ether	1	1
43	Total	1	1
UPPER ABDOMEN			
95	Ether Alone	10	2
21	Ether Reinforcement	5	2
25	Without Ether	1	0
141	Total	15	4
LOWER ABDOMEN			
117	Ether Alone	2	1
85	Ether Reinforcement	3	1
52	Without Ether	1	0
254	Total	6	2

Table 7 shows the results from spinocaine anesthesia with three complications occurring in upper abdominal operations only, and then only when inhalation anesthesia had been added.

TABLE VII

		Pulmonary Complications	Deaths
SPINOCAINE			
8	Upper Abdomen	0	0
16	Lower Abdomen	0	0
34	Outside of Abdomen	0	0
58	Total	0	0
SPINOCAINE, NITROUS OXIDE			
4	Upper Abdomen	1	0
2	Outside of Abdomen	0	0
6	Total	1	0
SPINOCAINE, ETHYLENE			
6	Upper Abdomen	0	0
1	Outside of Abdomen	0	0
7	Total	0	0
SPINOCAINE, ETHYLENE, ETHER			
6	Upper Abdomen	2	1
77	Grand Total Spinocaine	3	1

Table 8 gives operations with nitrous oxide and ethylene. The one complication which resulted in death followed nitrous oxide and was in a radical breast amputation. Bronchitis was the complication in the three cases following ethylene.

TABLE VIII

NITROUS OXIDE

		Pulmonary Complications	Deaths
9	Lower Abdomen, Pelvis	0	0
7	Chest	1	1
104	Others Outside of Abdomen	0	0
120	Total	1	1

ETHYLENE

5	Upper Abdomen	0	0
23	Lower Abdomen, Pelvis	1	0
33	Neck	1	0
61	Cervix, Vagina, Perineum	1	0
84	Others Outside of Abdomen	0	0
205	Total	3	0

After nitrous oxide and ethylene, with the addition of ether (Table 9), the incidence of pulmonary complications was higher, and again all the trouble followed abdominal work, the rate being higher when the upper abdomen was molested.

TABLE IX

NITROUS OXIDE, ETHER

		Pulmonary Complications	Deaths
3	Upper Abdomen	2	1
14	Lower Abdomen, Pelvis	1	0
29	Outside of Abdomen	0	0
46	Total	3	1

ETHYLENE, ETHER

12	Upper Abdomen	1	0
71	Lower Abdomen, Pelvis	2	1
34	Outside of Abdomen	0	0
117	Total	3	1

Table 10 is the story of ether compared with other anesthetics. When ether was used alone, upper abdominal operations were followed by almost five times as many pulmonary complications as lower abdominal and extra-abdominal operations. When ether was used as a reinforcement to other anesthetics, upper abdominal operations showed seven times as many complications as lower abdominal, and ten times as many as extra-abdominal operations. Other anesthetics used in upper abdominal cases gave only twice as many as in lower abdominal cases, and four times as many as for those outside the abdomen.

Comparing different anesthetics for the same regions:

Upper Abdomen.—Ether reinforcement resulted in over twice as many pulmonary complications as ether alone, and five times as many as other anesthetics.

Lower Abdomen.—Ether reinforcement was followed by twice as many complications as ether alone, and over 50 per cent more than other anesthetics. Ether alone was accompanied by even fewer complications than other anesthetics.

Extra-abdominal.—Ether reinforcement showed more complications than ether alone, and the latter twice as many as other anesthetics.

TABLE X

ETHER, INHALATION, ALONE

		Pulmonary Complications	Deaths
95	Upper Abdomen	9	2
117	Lower Abdomen, Pelvis	2	1
212	Total Abdomen	11	3
93	Outside of Abdomen	2	1
305	Total	13	4

ETHER, INHALATION, REINFORCEMENT

21	Upper Abdomen	5	2
85	Lower Abdomen, Pelvis	3	1
106	Total Abdomen	8	3
80	Outside of Abdomen	2	0
186	Total	10	3

OTHER ANESTHETICS WITHOUT ETHER

23	Upper Abdomen	1	0
48	Lower Abdomen, Pelvis	1	0
71	Total Abdomen	2	0
453	Outside of Abdomen	5	2
524	Total	7	2
1015	Grand Total	30	9

The thirty cases with pulmonary complications are shown in more detail in Table 11. These included 1 case of pleurisy with effusion, 2 of atelectasis, 9 of bronchitis, 4 of lobar pneumonia with 1 death, and 15 of bronchopneumonia with 8 deaths. Ages ranged from 7 to 72; in the fatal cases from 12 to 69, the average for both being 48. Eighteen of the 30 patients were over 50; 12 over 60. Six of the 9 fatalities were over 50; 4 over 60. The duration of the anesthesia in the 30 cases was from 25 to 185 minutes; in the 9 fatal cases from 40 to 125 minutes. The average in both was 80 minutes.

TABLE XI

PULMONARY

	Complications	Deaths
Pleurisy	1	0
Atelectasis	2	0
Bronchitis	9	0
Lobar Pneumonia	4	1
Broncho-Pneumonia	14	8
Total	30	9

AGES: 7 to 72; average, 48. 18 over 50; 12 over 60.
FATAL CASES: 13 to 69; average, 48. 13, 17, 29, 56, 59, 62, 62, 67, 69.
ANESTHESIA: 25 to 185 min., average 80.
FATAL CASES: 40 to 125 min., average 80.

Conclusions: A review was made of 1,015 anesthesias administered at the University hospitals. Pulmonary complications followed in 30 cases (3 per cent), with 9 deaths (0.9 per cent).

Six of the complications, including 4 deaths,

might easily be considered either as occurring too late to be related to the anesthesia or as being a part of a general septicemia, related to the surgical condition rather than to the anesthesia.

Ether administered alone caused about twice as many pulmonary complications as other anesthetics.

Ether used as reinforcement to other anesthetics caused five times the pulmonary complications in upper abdominal operations, twice as many in other types of operations.

Upper abdominal operations, as compared with extra-abdominal work, were followed by pulmonary complications ten times as frequently with ether reinforcement, five times as frequently with ether alone, and four times as often with other anesthetics. This indicates that ether is a potent factor in pulmonary complications, but that the upper abdomen as an operative field is a still more important consideration.

Ethylene causes less pulmonary irritation than any other inhalation anesthetic, and this feature is in fact almost negligible.

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SOME CLINICAL FEATURES OF OBSTRUCTIVE JAUNDICE*

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ANY physician who has studied the symptoms of many patients with jaundice will agree that the diagnosis is difficult if only because the clinical pictures encountered in actual practice do not often resemble the classical ones described in the textbooks. Much information is needed as to the frequency with which variations in the classical picture can be expected to occur; the atypical cases also deserve particular study. In an effort to clarify, in our own minds, the problem of differential diagnosis in cases of jaundice, we have analyzed the records of 130 cases of obstructive jaundice which have been carefully studied during hospitalization at The Mayo Clinic.

THE CLASSIFICATION OF JAUNDICE

Since Mann and his associates have proved conclusively that bile pigment is formed outside of the liver and is brought to it for excretion, we have learned to classify clinical cases of jaundice into three groups (McNee): (1) obstructive jaundice, including cases in which there is occlusion of or obstruction in the extrahepatic biliary passages; (2) intrahepatic jaundice, comprising cases in which the lesion lies in the hepatic parenchyma, either in the finer bile passages or in the cells of the liver itself, and (3) hemolytic jaundice, associated with increased destruction of blood cells and subsequent increase in the level of bile pigments in the blood (Fig. 1). Each of these groups presents a different therapeutic problem, and consequently a quick method of classification of any given case of jaundice is highly desirable. The points essential to a working classification, according to McVicar and Fitts, are as follows: "(1) The reaction of the jaundiced serum to the van den Bergh reagent (whether direct or indirect); (2) the height and behavior of the serum-pigment curve as determined by the van den Bergh test or by the icterus-index method; (3) the quantity of bile reaching the intestines as determined by siphonage of the duodenal contents, and (4) the presence or absence of pain, and its character when present."

With these data on hand, one usually can arrive at a working diagnosis in most cases of jaundice. If an anatomic diagnosis cannot be made positively, at least the obscure cases can be divided into surgical and nonsurgical groups. The significance of such prompt classification is obvious, when one recalls the injury which obstructive jaundice causes to the biliary passages and the hepatic parenchyma.

In attempting to diagnose the cause of jaundice, one should recall the percentage distribution and frequency of the various types as they are encountered in practice. In 450 cases of jaundice at The Mayo Clinic, Hartman found that in approximately 23 per cent the lesion was intrahepatic, in about 7 per cent the disease was of the hemolytic type, and in the remaining 70 per cent obstructive lesions of the hepatic or common bile ducts were present. Carcinoma accounted for about 25 per cent of the cases; of these, malignancy of the pancreas was the most common single cause, and tumors of the gallbladder and bile ducts taken together were about half as common. Metastatic lesions and general carcinomatosis accounted for a total of about 7 per cent of all cases of jaundice. Of the benign lesions, stones in the common bile duct were responsible for 20 per cent and stricture of the common or hepatic ducts for 10 per cent. From the foregoing, it is apparent that the three conditions which should be thought of first in attempting a differential diagnosis in a case of jaundice are intrahepatic jaundice, carcinoma, and stone in the common bile duct.

STONE IN THE COMMON BILE DUCT

Our series of patients with stone in the common bile duct comprised seventy-one. In this group the usual predominance in females was noted (a ratio of about three females to two males). The average age of the patients was fifty-five years, and the average duration of

*From the Division of Medicine, The Mayo Clinic, Rochester, Minn. Read before the Minnesota State Medical Association, Duluth, Minn., July 14 to 16, 1930.

symptoms, six years. About a third of the group had had previous surgical operations on the biliary tract.

The essential characteristics of jaundice due to stone in the common bile duct are that it is intermittent, painful, rarely complete, and that

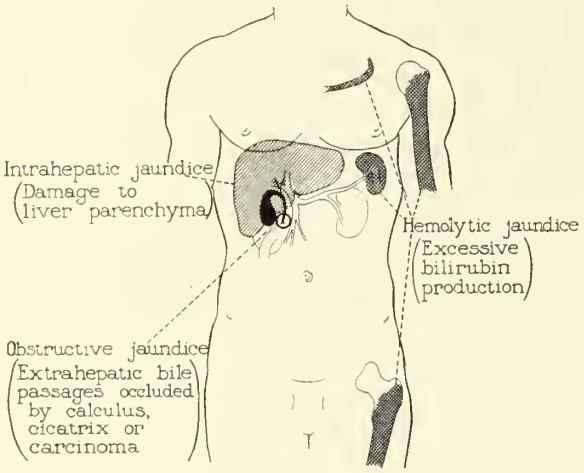


Fig. 1. Various types of jaundice.

the associated symptoms are usually of long duration.

Analysis of the symptom of pain in this group of cases brings out a number of interesting points. Forty-nine of the patients had had typical biliary colic; seven had had violent seizures of epigastric pain; one patient had had definite colic situated in the left upper quadrant of the abdomen, and another patient had had only lumbar pain. Diffuse abdominal pain, without accurate localization, was noted in seven cases. In six cases the jaundice was painless or practically so. From the foregoing, it appears that in nearly 30 per cent of cases of stone in the common bile duct, the pain is atypical in its localization or nature, or so mild that it is only a minor feature in the case. In all but six cases, however, the character of the attacks was such as to suggest either actual colic or its equivalent. The relation of these painful seizures to the appearance of jaundice is significant. In fifty-five of the seventy-one cases, jaundice followed immediately after the attack of pain. In ten cases, the jaundice came on shortly after what might be termed the equivalent of colic. In the remaining six cases, there had been too little pain to connect it accurately with the history of the onset of jaundice, although in all of these cases, general malaise, chills, nausea and vomiting, and other minor symptoms were associated with the first appearance of the jaundice. In a large majority of cases, painful attacks, of whatever type, were followed by residual soreness, nausea, and vomiting. Chills and fever were noted in about half of the cases, and pruritus in more than half; usually these symptoms were at their height shortly after an attack of pain. These associated phenomena are often helpful in identifying the cause of atypical colic. About half of these patients had had attacks of pain and jaundice prior to the attack which brought them to the clinic for relief, and frequently inquiry into the nature of these earlier and half-forgotten attacks afforded us most valuable information.

There are two features about the clinical picture of stone in the common bile duct which have not received much attention. The first feature is the tendency of the attacks to increase in frequency and severity; this is a striking point in many histories. The second feature is indigestion, which often antedated by years the attacks of pain. In all but four in this group of seventy-one cases, there was a long history of intolerance to food, postprandial distress, flatulence, and so forth. Just as a patient with pyloric obstruction frequently will forget to mention the original symptoms of ulcer, so do these persons with jaundice due to stone in the common bile duct forget to mention the old symptoms of indigestion and abdominal distress which characterized the onset of their illness.

The importance of determining the patency of the biliary passages in obstructive jaundice has been emphasized by Crohn. This information may be obtained by duodenal siphonage or by examination of the stools; the patient's statements alone rarely can be relied on to decide this question. In our cases of stone in the common bile duct, bile was present in the material obtained by duodenal drainage in 80 per cent of the cases in which intubation was performed, and examination of the stools furnished confirmatory evidence in many cases. In only ten cases of the whole group was there evidence of complete biliary obstruction, and in these it is not certain that a longer period of observation and more frequent duodenal drainage would not have revealed at least a trace of bile. Our impression is that it is not common for a stone completely to occlude the biliary passage for any length of time. In many cases drainage of bile has been absent on

the earlier tests, but after a few days bile appeared in the stools or on duodenal siphonage.

The incomplete and intermittent nature of the biliary obstruction is reflected in the curve of serum bilirubin. In about 70 per cent of the cases the values for serum bilirubin do not at any time exceed 15 mg. for each 100 c.c. In about a third of the cases it was not more than 5 mg. at any time. This is in notable contrast to the levels of serum bilirubin encountered in obstructive jaundice due to carcinoma. Frequently a sharp rise in the serum bilirubin after a painful attack will serve to establish the fact that a stone is present. Other laboratory data do not give very helpful information. Cholecystography with the use of dye is of little value in the presence of jaundice; roentgenograms of the region of the gallbladder occasionally may reveal a stone. Severe anemia is uncommon, although in about 40 per cent of our cases there was some reduction in the concentration of hemoglobin and in the erythrocytes; leukocytosis may be present during the acute attack, but usually it subsides speedily. The coagulation time was within normal limits in all but eight cases; in these it was definitely prolonged, but usually was less than twenty minutes. There was no definite correlation between the coagulation time and the severity of the jaundice, and occasionally we have noted a hemorrhagic tendency in cases in which the coagulation time was within normal limits.

Numerous variations from the typical picture are encountered; in fact, about a third of all cases of choledocholithiasis may be atypical in one or more respects. Jaundice may be absent following colic in some cases; Jordan and Weir are reporting a group of proved cases of this type. Cases of recurrent stone also give difficulty; five patients in this group gave a history of choledocholithotomy done elsewhere, with subsequent reformation of stones. The cases which give the most trouble in diagnosis are those in which patients are older, the history is short and pain is atypical. To establish a positive diagnosis in this group, one must often resort to exploration. Fortunately these cases are rare, but some of them have so many of the characteristics of neoplastic obstruction of the duct that they present difficulty in diagnosis.

The relative frequency of the symptoms and signs of stone in the common bile duct are shown in Table 1. The complications which may accompany obstruction of the common bile duct by stone are of interest because of their bearing on the clinical picture and their effect on surgical risk. In this group, perforated or ruptured gallbladder occurred in four cases; fistulous connections with the duodenum or colon were present in three cases, and an external fistula was noted in two cases. Biliary cirrhosis was often found at operation or at necropsy. Inflammatory conditions of the bile ducts were less common. In two cases subdiaphragmatic abscess followed operation. Chronic pancreatitis was present in nine cases, and hemorrhagic pancreatitis in two. In jaundice due to stone, considerable hemorrhage is not as common as one might expect. In only one case was it the apparent cause of death. In fifteen of this group of cases renal insufficiency occurred as a complication either before or after operation. As a rule, it was only moderately severe and could be controlled by intravenous administration of fluids.

TABLE I

JAUNDICE DUE TO CHOLEDOCHOLITHIASIS (71 CASES)*

Relevant symptoms. signs and history	*Incidence per cent*
Previous indigestion	94
Previous operations on biliary passages	33
Previous attacks with jaundice	44
Typical colic	70
Atypical colic	22
Minimal pain	8
Serum bilirubin less than 10 mg. in each 100 c.c.	66
Serum bilirubin 10 to 20 mg. in each 100 c.c.	27
Serum bilirubin more than 20 mg. in each 100 c.c.	7
Biliary passages patent	86
Biliary passages occluded	14
Chills and fever	52
Pruritus	60
Prolonged coagulation time	11

*Ratio of males to females 2:3.

STRICTURE OF THE COMMON BILE DUCT

Stricture was the cause of the jaundice in twenty of the cases in our series. A brief statement of the current hypothesis concerning the etiology of stricture seems desirable. Its primary cause is not definitely known. Whatever the cause, there appears to be little doubt that in predisposed subjects, cholecystectomy is the most significant factor in the development of this condition. In the records of The Mayo Clinic, there

has been only one case in which stricture of the common bile duct occurred without previous operation on the biliary tract and in that case stricture was due to congenital torsion of the gallbladder and ducts. There appear to be two types of stricture: those which are essentially

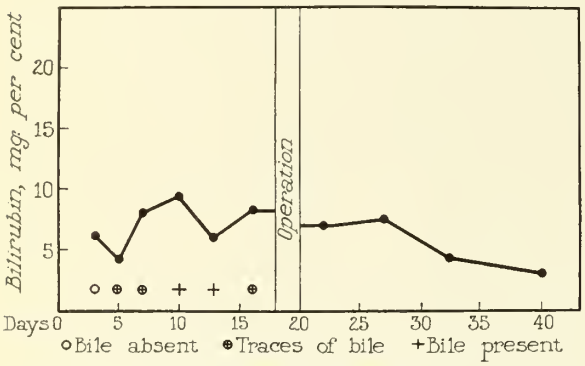


Fig. 2. Curve of serum bilirubin. Results of duodenal drainage in a case of stricture of the common bile duct are shown.

due to surgical trauma, and in which the symptoms develop immediately after operation, and those in which it is probable that direct trauma has not occurred, the stricture developing months after the primary operation. Judd has stated that in a fairly large percentage of cases the condition results from obliterative cholangitis, which is at least partially independent of surgical trauma. He has reported two cases in which jaundice developed four and thirteen years, respectively, after operations on the biliary tract. It is difficult to explain such cases on the basis of operative trauma alone. It seems probable that in many cases of disease of the biliary tract, widespread inflammatory conditions exist in the gallbladder, liver, and biliary passages. In certain cases this inflammatory condition persists after cholecystectomy and produces obliterative fibrosis of the ducts. On this basis one can explain some of the phenomena noted clinically in this group of cases.

The average age of the patients with stricture of the common bile duct in our series was about forty-two years. Eighteen of the twenty patients were females, a point which emphasizes the relatively greater frequency of benign lesions of the biliary tract in women. The total duration of symptoms in this group ranged from six months to thirty years; the average duration was approximately ten years. Since previous surgical operation on the biliary tract was a factor in every case, it is advisable to consider separately the symptoms which occurred before operation. In seven of the twenty cases there was definite biliary colic, and in three there were other and milder symptoms of cholecystitis. For those symptoms cholecystectomy had been performed in nineteen cases and cholecystostomy in one case. None of the patients had been relieved permanently, although one or two of them had had relatively long periods of comfort after the primary operation.

The postoperative symptoms vary somewhat, apparently depending on the degree of cholangitis present and on the presence or absence of surgical trauma. In about a third of the cases jaundice developed immediately after operation, in eleven it developed in from two to eighteen months, and in one case jaundice appeared for the first time two years after the original operation. In another case jaundice developed after an external biliary fistula had been closed. Prolonged postoperative biliary drainage is common in such cases, although it varies greatly in time of appearance, duration, and amount. In general, it bears an inverse relationship to the degree of jaundice present.

After the primary operation, colic was usually somewhat less severe than before. The attacks of pain were often accompanied by chills, pruritus, fever and other signs of biliary obstruction and infection. Indigestion and signs of nutritional disturbance usually increased progressively after the primary operation. In practically all cases there was more or less constant aching or soreness in the upper part of the abdomen.

Obstruction of the biliary tract was complete in six of this group of cases, and of these the obstruction could almost invariably be attributed to direct surgical trauma. In the remaining cases the biliary passages remained partially patent, and small amounts of bile could be obtained by duodenal drainage.

The degree of jaundice, as shown by examination of the serum bilirubin, usually was not great. In eighteen of the cases, the concentration of serum bilirubin was less than 15 mg. in each 100 c.c. Early in the course of the disease the serum bilirubin may fluctuate considerably. A typical curve is shown in Figure 2. The longer the illness the more constant the jaundice seems to be, a fact which may be referred to the biliary cirrhosis and cholangitis, which are almost invariable accompaniments of stricture. In fact

in cases of multiple operations for the relief of stricture of the common bile duct, the end-result is almost identical with the clinical picture of advanced primary biliary cirrhosis. In many cases of stricture there is a large element of intrahepatic jaundice, and the longer the case has progressed, the more likely one is to encounter hepatic insufficiency due to long-standing infection and obstruction of the biliary passages. This explains, at least to some degree, the difficulties of treatment in such cases. In fact, the clinical course of benign stricture of the common bile duct owes a good many of its characteristic features not so much to biliary obstruction as to injury to the parenchyma of the liver. Such injury probably accounts for the marked predisposition of these patients to serious hemorrhage. In our series of twenty cases a coagulation time of more than ten minutes was noted in about half of the cases, and in some of these the coagulation time was prolonged to half an hour or longer. Anemia is common (85 per cent of this group), often resulting from hemorrhage. Hepatic insufficiency, secondary to the marked biliary cirrhosis, was not uncommonly observed, particularly as a terminal feature.

It is fairly easy to make a clinical diagnosis of stricture of the common bile duct. Recurrent stones in the common bile duct may present a somewhat similar picture; occasionally stones may form above a stricture and thus may complicate the clinical picture. The difficulty arises not in the diagnosis but in the treatment of these cases. Nineteen of our twenty patients were operated on at the clinic; one patient died of hemorrhage before operation could be performed. Before the patients came to the clinic, eight of them had had one operation for repair of stricture, three had had two such operations, and two had had a fourth attempt made to repair the biliary passages. The difficulty which is encountered in preparing such patients for operation, the great technical difficulty of the operation itself, and the liability to postoperative complications, such as hemorrhage, and hepatic and renal insufficiency, all combine to make stricture of the common bile duct an extremely serious condition. In spite of this, good temporary results were obtained in half of the cases in this group, and in six of the others, cure may be regarded as permanent.

JAUNDICE DUE TO MALIGNANT OBSTRUCTION

The four varieties of carcinomatous obstruction of the common bile duct are: (1) primary tumors involving the head of the pancreas; (2) primary tumors of the gallbladder; (3) primary tumors of the common, hepatic, or cystic ducts, and (4) metastatic lesions involving any of these structures or the lymph nodes adjacent to the ducts. The diagnosis in all of these cases is likely to be difficult, and in many cases one can only hazard a shrewd guess that the obstructing process is of a malignant nature. Metastatic lesions are not common and frequently can be diagnosed on the basis of a primary malignant growth elsewhere in the body. Primary tumors constitute the really difficult diagnostic problem.

Our series includes thirty-nine cases of obstruction due to carcinoma. In twenty-six of these the lesion was carcinoma in the head of the pancreas, in eight the carcinoma was in the ducts, and in five in the gallbladder. In the group of patients with pancreatic carcinoma there were twenty-one males and five females; the average age was about fifty-five years. The total duration of symptoms in the cases of pancreatic carcinoma averaged about twenty-two months, and half of the patients had had symptoms for less than a year. Two patients had rather long histories, but their earlier symptoms may well have been due to lesions other than carcinoma. Practically all of the patients had had vague complaints of disturbance in the upper part of the abdomen, which antedated by some time the appearance of the jaundice. These disturbances took the form of abdominal soreness, flatulence, anorexia, dull boring epigastric pain and even atypical colic. The latter feature was noted in about 25 per cent of the cases. Three of the patients had had previous operations on the biliary tract, two for cholelithiasis and a third for indeterminate obstruction to the common bile duct, for which cholecystoduodenostomy had been done.

The relation of pain to the development of jaundice in carcinoma of the pancreas is significant. It is often taught that tumors in this situation produce a painless type of jaundice. In our series some degree of pain has been present in all but three cases. Other authors report a similar incidence of pain. Judd and Parker, in a series of thirty-four cases, found that 38 per

cent of the patients did not have pain, 35 per cent had colic, and 24 per cent had dull, boring pain in the upper part of the abdomen. In Mussey's series, 88 per cent of the patients had either dull pain or colic. The pain rarely coincides with the onset of the jaundice as it does in cases of stone in the common bile duct, and the colic which the patients describe is usually atypical. Dull, boring pain, often referred through to the back, is an equally common type of distress.

In six of the cases of pancreatic carcinoma, jaundice was the initial symptom; pain appeared later. The duration of jaundice was notably brief; the average duration in this series was about fourteen weeks at the time the patients presented themselves for examination. As a rule, jaundice is persistent once it appears. In only two cases in this group was the jaundice intermittent and in one of them the original jaundice may have been of intrahepatic origin. The average level of serum bilirubin was much higher than that seen in cases of stone in the common bile duct or in stricture. In the majority of the cases the values for serum bilirubin were between 15 and 30 mg. Stationary or gradually rising curves of serum bilirubin were the rule. In the few cases in which values for serum bilirubin were low, there was often a history of hemorrhage to explain the low figures. Complete obstruction to the biliary passages is the rule, as Crohn has shown, but there are numerous exceptions. In sixteen of the cases bile was not obtained either in the stools or in the material from duodenal siphonage. Bile was obtained on drainage in four cases, and in two of these it was heavily mixed with blood. In three additional cases there was also blood in the material obtained by duodenal drainage. The finding of blood in the duodenal content is rare in benign lesions and not uncommon (20 per cent of our cases) in the presence of carcinoma. Crohn called attention to the value of this diagnostic point.

A distended gallbladder has been considered the most significant of the physical features which have been supposed to be diagnostic of carcinoma of the pancreas. In all of this group of cases the abdomen was carefully palpated to determine the presence or absence of this phenomenon. A definitely distended gallbladder was found in eleven cases. It was questionably palpable in seven additional cases, and was not enlarged in the remaining eight. In another series reported from the clinic,[3, 15] the gallbladder was palpably enlarged in about 50 per cent. A much higher percentage is described in figures from necropsy. The liver was uniformly enlarged in twenty of the cases in this group.

TABLE II

JAUNDICE DUE TO CARCINOMA OF THE PANCREAS (26 CASES)*

Relevant symptoms, signs and history	*Incidence per cent*
Previous operations on biliary tract	12
Colic	27
Dull pain	61
Minimal pain	12
Pain followed by jaundice	7
Serum bilirubin less than 10 mg. in each 100 c.c.	16
Serum bilirubin 10 to 20 mg. in each 100 c.c.	44
Serum bilirubin more than 20 mg. in each 100 c.c.	40
Biliary passages completely occluded	85
Biliary passages patent	15
Blood in duodenal drainage	25
Palpable gallbladder	55
Chills and fever	36
Pruritis	75
Prolonged coagulation time	40

*Ratio of males to females 4:1.

Perhaps the most significant point about jaundice due to carcinoma at the head of the pancreas is its progressive and persistent nature. Complete obstruction of the bile passages (as shown by absence of bile in the material obtained by duodenal drainage and by high fixed levels of serum bilirubin) is of great importance clinically, and a presumptive diagnosis often can be based on its presence or its absence alone.

Among the incidental symptoms may be mentioned pruritus, which was present in nineteen cases of the series, diarrhea, which was noted in eight, and melena, which occurred in three. In one case, ascites was a late development. In three cases the pancreatic tumors had evidently impinged on the duodenum; they provoked symptoms of ulcer in one case, and of partial duodenal obstruction in one case; a positive roentgenogram for duodenal ulcer was obtained in one case. Laboratory data did not give diagnostic information, although anemia was more common in these cases than in cases of jaundice due to benign obstruction; the concentration of hemoglobin was less than 60 per cent in about two-

thirds of the cases. An elevated level of blood sugar was found in two cases; other signs of pancreatic insufficiency were uncommon. In about 40 per cent of the cases, coagulation time was prolonged, usually ranging from ten to fifteen minutes. The relative frequency of the important diagnostic data in carcinoma of the pancreas is given in Table 2.

In biliary obstruction due to carcinoma of the gallbladder or ducts, the diagnostic signs are much less definite; in fact, we have no reliable diagnostic criteria concerning this group of cases. Rolleston had divided the symptoms of carcinoma of the gallbladder into three groups: (1) symptoms connected with preëxisting cholelithiasis; (2) the local effects of malignant disease of the gallbladder, and (3) complications due to invasion of adjacent parts by the tumor, and to metastasis in the liver, peritoneum and elsewhere. The small number of carcinomas of the gallbladder in our series (five cases) does not permit of conclusions. The usual predominance in females was noted, and also the long prodromal symptoms suggestive of cholecystic disease. It is well known that carcinoma of the gallbladder is rarely found in the absence of cholelithiasis; in all of our cases there had been symptoms suggesting cholecystic disease for a long time before the onset of jaundice. The development of jaundice in cases of carcinoma of the gallbladder indicates that the disease has reached a terminal stage. All of our patients were definitely cachectic, persistently jaundiced, and suffering from more or less severe pain in the right upper quadrant of the abdomen. Jaundice was usually of short duration and intense. Epigastric soreness, flatulence, nausea, and vomiting were constant. A tendency to hemorrhage was noted in all five cases. In two cases the gallbladder was palpable, and in one of the other cases there was a questionable mass in its vicinity.

Numerous reviews of large series of cases of carcinoma of the gallbladder appear in the literature, and the consensus of opinion is that there are no positive diagnostic signs, although pain, a palpable tumor, and complete and progressive jaundice in a cachectic patient are suggestive. Enlarged supraclavicular lymph nodes should be carefully sought. In one case biopsy of such a node established the diagnosis of malignancy and saved the patient a needless operation.

Our series of cases of jaundice due to carcinomatous obstruction of the bile ducts included eight of carcinoma of the common or hepatic ducts. Again, this series is too small to permit of conclusions. Marshall recently reviewed a series of forty-nine cases, which have been recorded at the clinic in the last twenty years.

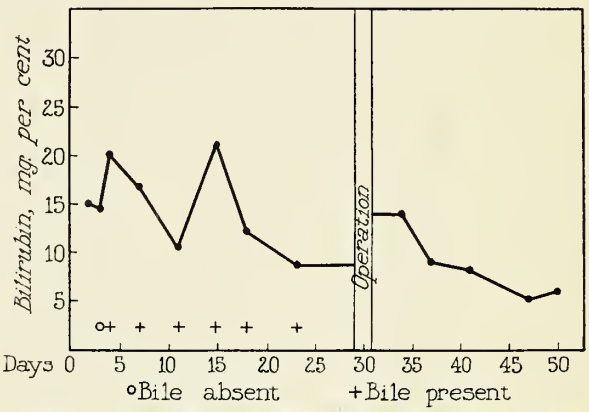


Fig. 3. Curve of serum bilirubin and results of duodenal drainage in a case of papillary tumor of the right hepatic duct.

From his data and from the series of cases reported by Outerbridge, Rolleston and McNee, certain points stand out. One is the predominance of the disease in male subjects (4:1). The age incidence is about similar to that noted in cases of carcinoma of the pancreas. Pain appeared to be less severe than in the groups of cases previously mentioned. In fifteen of Marshall's cases, the course of the disease was entirely painless, and in eight others the onset of jaundice was not accompanied by pain. About 40 per cent of the patients had atypical colic. As one might expect, obstruction to the biliary passages was usually complete. However, in two recent cases, there was a moderately free flow of bile on duodenal drainage; the tumors were situated in one or the other hepatic duct. The gallbladder was felt in nineteen of Marshall's cases, a fairly high incidence when one considers that seven of these patients had tumors of the hepatic ducts, which could not interfere in any way with the emptying of the gallbladder. In two of our eight cases, there was marked elevation of lipoid substances in the blood. In one of these two cases, obstruction was complete, whereas in the other case free flow of bile was obtained on duodenal siphonage. The curve of serum bilirubin and results of duodenal drainage in this last case are given in Figure 3. The fluctuating character of this patient's jaundice led to the suspicion that a stone was present in the common bile duct, and

exploration was advised. At operation a papillary tumor of the right hepatic duct was found. To summarize, it may be said that there are no reliable diagnostic signs in cases of tumor of the biliary passages, and one must be satisfied with establishing a diagnosis of malignant obstruction, without attempting to localize the lesion.

Although it is not possible to differentiate accurately the site of carcinomatous obstruction to the biliary passages, one is usually able to make a fairly accurate diagnosis of the condition in general. The atypical character of the pain, its lack of relation to the onset of jaundice, the persistence of jaundice once it has been established, the evidence of complete biliary obstruction, the cachectic appearance of the patient, and the progressively downward course, all are of great help in establishing a diagnosis. Gross blood in material obtained by duodenal drainage is almost pathognomonic. In our experience the effect of the jaundice on the patient also seems significant. In cases of stone in the common bile duct the attacks of jaundice are often well tolerated by the patient, in spite of the fact that most of these attacks are associated with definite signs of cholangitis. Obstruction due to carcinoma is essentially an aseptic condition, but it certainly has a far more serious effect on the general condition of the patient. This fact may be attributed perhaps to the high degree of hydrohepatosis, the resultant atrophy of the parenchyma of the liver, and to the injury which the carcinoma itself is producing.

TREATMENT

Without encroaching on the field of surgical colleagues, a word may be said about the surgical indications in obstructive jaundice. They are, briefly: (1) complete obstruction with distention of the biliary passages, with or without pain; (2) intermittent painful obstruction, and (3) doubtful conditions in which benign lesions are probable. These indications are necessarily rather broad. It has been said that the death rate from suicide of patients with complete biliary obstruction due to carcinoma is higher than the operative mortality for cholecystogastrostomy, a fact which one can readily understand when one observes the suffering from pruritus and pain which these patients undergo. Most cases of intermittent and painful obstructive jaundice are of benign origin, and there can be little doubt about the advisability of submitting such patients to operation. The third group encroaches on debatable ground. In any large group of cases of jaundice, there are many which can be diagnosed accurately only with the help of surgical exploration. When the question of surgical intervention is raised, it is the province of the clinician to appraise the severity of the risk and to do everything possible to reduce it by appropriate treatment. He should also assure himself that intrahepatic jaundice either is not present, or that it plays a minor part in the production of symptoms.

The four principal barriers to successful surgical care are renal and hepatic insufficiency, hemorrhage, and anemia. The first two are best avoided by the free use of solutions of glucose given intravenously. In our experience it is sometimes better to give solutions intravenously, before operation, than to wait for the actual development of trouble after operation. The value of glucose in obstructive jaundice recently has been reviewed by Ravdin. It may be said, however, that it is perhaps the most valuable single measure which we have at our command in caring for jaundiced patients. Since glucose has been more generally used it seems that deaths from renal and hepatic insufficiency are becoming less common.

The control of hemorrhage is still a problem. The use of calcium, as advocated by Walters, has been of great value, but it is not effective in every case. It should be emphasized that there is no demonstrable deficiency of calcium in obstructive jaundice.[4, 18] Nevertheless, calcium salts seem to exert a protective influence in hepatic lesions.[13] Transfusion is required in cases in which the hemorrhagic tendency is more severe and frequent repetition of this measure is often necessary. It has been noted[8] that there is an advantage in using a fasting donor and thus avoiding the reactions which jaundiced persons may show on receiving blood which is loaded with the products of digestion. Of the various anticoagulants which have been used, none has been of great value in our hands. Autohemotherapy, carried out by intramuscular injection, as suggested by Bollman, is more simple and practical, and deserves further trial. Irradiation of the spleen has had a large vogue in Europe, and seems to produce a good, although somewhat temporary, effect. Recently it has been

shown by Wright, Cowan and Hirschfelder that the use of concentrated solutions of glucose will elevate the concentration of blood calcium and will reduce the coagulation time in dogs with jaundice; Ravdin mentioned a somewhat similar phenomenon in human beings. In most cases of jaundice the measures just referred to will suffice to control hemorrhage. A small group of cases remains in which there seems to be an uncontrollable tendency to bleeding. Such a case recently has been noted at the clinic.[19] In this case there was reduction in the blood platelets as well as other signs of thrombocytopenia.

There are many minor points in regard to the care of patients with jaundice which are beyond the scope of this paper. One of these has to do with the selection of a time for operation. It has been noticed that the acutely jaundiced experimental animal is far more vulnerable than one in which jaundice has extended over a considerable period. The same may be said of the patient with jaundice, and care should be taken to avoid operation on patients in whom jaundice has been acute in its development or of short duration. Undue delay, on the other hand, may result in extensive hepatic injury. Each case appears to present an individual problem which must be acted on accordingly.

SUMMARY

An attempt has been made to show both the typical and atypical clinical characteristics of the various types of obstructive jaundice. In reviewing a series of this sort, perhaps the most striking feature is the fact that the atypical features are so common. This fact precludes a positive diagnosis in many cases of jaundice, and necessitates arbitrary division into surgical and nonsurgical cases. In all cases, however, the chances for diagnostic error are greatly minimized by a period of observation in hospital, a painstakingly accurate history in respect to pain, and the establishment of a curve of serum bilirubin to determine the intensity and the fluctuations in the jaundice. Such a period of observation permits one to determine the patency of the biliary passages by examination of the stools and by duodenal siphonage. It also establishes a better idea of the operative risk, and tends to reduce it as far as possible by permitting adequate preoperative preparation.

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A SYNOPSIS OF THE TREATMENT OF CHRONIC ARTHRITIS*

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THE treatment of chronic arthritis is one of the most complex of the problems in modern medicine. "Next to cancer, there is no more pressing medico-social problem than that of arthritis."[1]

The literature on the subject is burdened with glowing accounts of new drugs and the results produced by them. It is only after the physician has tried many of these new discoveries that he realizes how much better it is for him to adhere more closely to a saner routine, as more permanent improvement and actual progress is made by following such a course.

It is not intended that this paper will cover at all thoroughly the treatment of arthritis. The more strictly orthopedic aspect will be gone into in some detail and the other phases of treatment merely mentioned.

No time will be spent on the classification of the disease except to state that two forms are recognized. Proliferative arthritis, which is accompanied by such terrible deformities in younger people, and degenerative arthritis, which causes so much discomfort in older individuals, are to be considered.

In both types of arthritis, the treatment must be initiated by a thorough examination of the patient. Focal infection in teeth, tonsils, sinuses, prostate, and bowel are carefully searched for and, if found, are eliminated as thoroughly as possible.

Postural defects or other indications of faulty body mechanics should be remedied by the use of supports and supervised exercise.

The abnormally low basal metabolic rate present in 39 per cent of cases, according to Swain and Spear,[2] is treated with Lugol's solution or thyroid substance, and the lessened sugar tolerance found by Pemberton and others,[3] is favored by the administration of a low carbohydrate diet.[4]

The various drugs in use are too numerous to mention. It is found that sodium salicylate gives the maximum relief of pain and is not at all harmful. As there is no specific against the disease, the use of any harmless substance giving comfort to the patient is often all one has at his disposal.

Heat is a boon to all arthritics[5] and the method of administration not of the greatest importance. Best results have been obtained by the use of cabinets, or electric cradle baths, which, by their diaphoretic action, assist the general elimination. Local heat to the affected joints by the use of the electric baker, infra-red lamp, or diathermy helps to relieve the pain and diminish the swelling. A baker is very simple to construct and its usefulness unquestioned. As much heat as the sufferer requires is at all times available.

One other very important measure which must be emphasized is the use of foreign protein reaction produced by the intravenous administration of triple typhoid vaccine as suggested by Miller and Lusk, Albumose (Merck's) suggested by Kolmer,[6] Coley's Fluid,[7] and others. Very beneficial results have been obtained in cases which show signs of activity in the joints. The pain is quickly relieved, swelling in the joints subsides, and general improvement results in a definite percentage of cases. The method of administration is very simple. Beginning with 0.5 min. of triple typhoid vaccine (Minn. State Board of Health) intravenously, the doses are gradually increased 0.5 min. at a time, until 2 min. are given. Doses are given five days apart and in courses of five or six. The patient should be kept under observation, as the reactions are sometimes very severe.

Turning now to the more strictly surgical aspects of the disease, the thought of deformities immediately presents itself. Can these deformities be prevented and what can be done with them when they do occur? "We cannot prevent all deformities but we can prevent most of them," is a statement made by Pemberton.

The question of the prevention of deformities is one of prime importance, particularly to men in general practice. One of the great pleas made by all orthopedic surgeons is made to the general practitioner, begging him to apply splints of some

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 16, 1930.

kind to every patient who is confined to bed because of any illness affecting his locomotor system. Much of our work in the treatment of arthritis, infantile paralysis and tuberculosis is the correction of deformities which could have been, to a great extent, prevented.

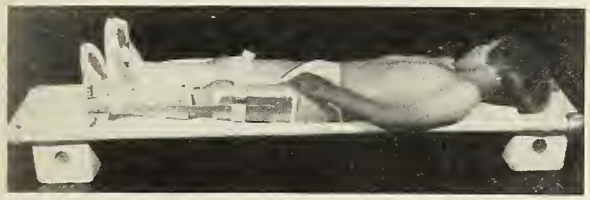


Fig. 1. Child is pictured fitted with splints holding the lower extremities in the position of optimum function. A sheet metal and strap iron splint fitted with felt pads and straps is shown on the left leg while a moulded plaster-of-Paris splint is shown on the right. A Bradford frame is used to keep the back straight and the hips from becoming flexed.

In the acute onset or in acute exacerbations of the chronic disease, pain is present in the joints on the slightest motion. The muscles, by going into spasm, attempt to relieve the pain by holding the joints immobilized. The powerful flexor muscles hold extremities in flexed positions and if these positions are allowed to persist, deforming contractures result. It is essential in joint disease to be aware of the possibility of ankylosis and, if this condition is to develop, to hold the joints in the position of optimum function.

May we consider first of all the splints available. Plaster of Paris, because of its great adaptability, probably ranks highest, with sheet metal splints, aluminum splints, and padded wooden boxes next in order. For the spine, a bed with two mattresses and boards between them and the springs to prevent sagging, is always available to everyone. Bradford frames and plaster beds are probably the most ideal. A leather and steel back brace of the Taylor type can be furnished for ambulatory treatment (Figs. 1 and 2).

A knowledge of the optimum position for function is very essential. For the shoulder the position is one of 75° abduction and 15° of forward flexion with the palm of the hand directed toward the face. If one elbow is involved it should be held at a right angle in the case of a man, and below this point if the patient is a woman. If both elbows are involved one should be held below and the other above a right angle. The wrist should be held in the more powerful grasping position, slightly hyper-extended. The hip is best if it is held abducted, externally rotated, and flexed a few degrees while the knee is best if held flexed 5 to 10°.

At this point a word of warning must be injected. The too prolonged fixation of joints is very harmful, as ankylosis will surely follow, whereas it might not have developed if motion



Fig. 2. A modification of the Jones abduction frame is shown. The method of keeping the feet in the right angle position, the knees in a few degrees of flexion, the hips slightly abducted and the back straight with the normal lumbar curve preserved, is clearly pictured. This splint is made of malleable iron so that any adjustments can be made as mild degrees of deformity are overcome.

had been started earlier. With the subsidence of pain and tenderness, the joints should be baked and moved gently both actively and passively. The efforts of the patient to move the extremities benefits both the joints and atrophied muscles. Pump-handling stiffened joints does much harm by producing denser adhesions in response to the vicious irritation.

Synovectomy and removal of loose bodies.—Thickening of the synovial membrane with formation of villous processes which project into the joint spaces is frequently found in chronic arthritis. Frequent pinching of these villous processes in movements of the joints results in repeated attacks of joint pain, synovial swelling and effusion. Synovial tags, osteophytes, or fragments of joint cartilage may become detached. These loose bodies are a constant source of annoyance by causing repeated catches or locking of the joint. Synovial swelling and effusion usually follow when these bodies become pinched. Swett[8, 9, 10, 11, 12] states that removal of the synovial membrane from a diseased joint has a threefold purpose: (1) it removes joint exudate which would not absorb by the usual channels; (2) it removes infected tissue which may be considered as a secondary focus of infection prolonging the disease; (3) it allows improvement in the general metabolism because of the early resumption of active exercise.

Excision of these fringes, as much of the synovial membrane and as many osteophytes as can be reached, or removal of loose bodies, is accompanied by marked relief. A careful and thor-

ough synovectomy is followed by a short period of rest until healing has taken place before vigorous physiotherapy is instituted. The physiotherapy referred to is chiefly active motion of the joint by the patient's own efforts but not to the extent of producing irritative symptoms. Early

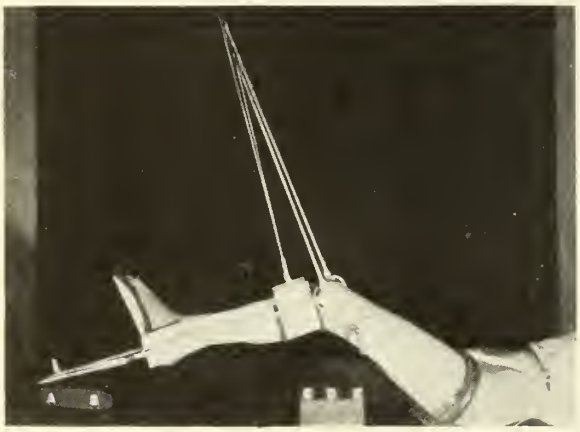


Fig. 3. The McMurray splint. An adjustable splint for the correction of flexion deformities of the knee is shown. Foot piece *B* attached to adhesive strips glued to the leg holds the foot at a right angle and rests on the side bars of the splint so as to prevent rotation of the leg. Traction downwards tending to straighten the knee is obtained by tightening the rope between the foot piece *B* and the lower end of the splint *A*. Traction upwards upon the upper end of the leg is made by tightening the rope passing from the felt pad *C* up over the top of the vertical pad of the splint. This pull prevents subluxation of the head of the tibia on the condyles of the femur as the joint is straightened. The direction of the traction on the extremity is changed as the knee straightens by adjusting the hinges *D* with the metal key *E*. Some of the muslin slings have been left off for the sake of clarity.

resumption of exercise after synovectomy results in general improvements in body metabolism, muscle tone, and physical comfort.

A patient who is willing to coöperate in the treatment of his disease need have no fear of a stiff joint following either of the above mentioned operations. J. Albert Key[13] has shown that there is replacement of the synovial membrane by a tissue of fibroblastic origin which takes on the function of the synovium.

If motion is present in a joint to such an extent as to be of definite functional value every effort must be made to preserve it. Frequently, due to the presence of a moderate flexion contracture, the motion present cannot be utilized. An example may be cited in the case of contracture of the knee joint. Frequently the joint is flexed so that weight bearing is impossible but there may be good available motion inside the angle of flexure. If the limb can be put in a position of good function and at the same time preserve the motion present, an excellent result will be obtained.

Frequently a joint stiffened by intra- or extra-articular fibrous adhesions retains a few degrees of motion. In this case the correction can be obtained through the joint itself. The method of widest acceptance is that of gradually stretching the contractures by the use of adjustable splints (Fig. 3) or plaster of Paris wedging dressings (Fig. 4). Either of these measures may be preceded by tenotomy of the contracted tendons causing the deformity. A carefully fitted, well padded plaster of Paris dressing may be applied to the extremity in the deformed position. A transverse cut is made through the full thickness of the plaster opposite the affected joint line on the side of the concavity. By insinuating wooden blocks of increasing thickness the flexion of the joint is gradually overcome as the gap in the plaster increases. Undoubtedly this is a method which is available to every practitioner. Splints of the adjustable type are very efficient but require careful observation and repeated adjustments as the deformities are overcome.

Silver[14] has shown very conclusively that the joint capsules play a large part in the maintenance of deformities. The denseness of the scar formation in these tissues practically prohibits its correction of contractures, and if forcible means are used the result is often a subluxation of the joint. By dividing the capsule on the side of flexion, contractures can be corrected completely, or nearly so, at once. The limbs are held for a short time in plaster of Paris and then immobilization is followed by use of physiotherapy directed towards active and passive motion. A warning must be issued against the complete correction of contractures if, by so doing, the vessels and nerves in the area would be put under too much tenson. The reason for the warning and the results which would follow are obvious.

Forcible manipulation of joints to correct contractures must be mentioned, but this method is not a safe one except in the hands of an expert.

A few degrees of motion in a diseased joint is very seldom of any functional benefit and only too often it is a cause of disability because of the accompanying pain. The problem of treatment in these cases is difficult. One must decide whether a firmly ankylosed joint in good functional position is more advantageous to the patient than a joint upon which an operation for the production of more motion has been attempt-

ed. It must be remembered that many of the arthroplastic and similar operations are followed by a recurrence of ankylosis. From the economic standpoint, the early ankylosis of the joint may be to the patient's benefit.

The operations designed to produce complete ankylosis in the joints are all fairly satisfactory. Probably the best procedure is the intra-articular fusion or arthrodesis. Extra-articular fusion may be obtained by a similar type of operation and as the joint is not opened the shock is not so severe. Fixation in plaster of Paris is maintained after operation until ankylosis has been obtained.

As regards the correction of deformities in joints which are completely ankylosed, much can be said. The methods to be used depend upon whether a movable joint, or a fixed joint in good functioning position, is to be the object attained. Osteotomies of the linear or cuneiform types allow the bones entering into the ankylosed joints to be placed in the desired position. Plaster of Paris dressings are applied to maintain the extremity in this position until union takes place. In many cases this is the most desirable procedure as it gives freedom from pain, an extremity in good position for function and an earlier return to work than is obtained in the other type of operation. The joints, however, remain firmly ankylosed.

Many operations have been described for the production of motion in ankylosed joints. A discussion of the various methods with evaluation of end-results is too big a subject to be considered at this time. There are a few general considerations which could be mentioned. If both hips are ankylosed an arthroplasty of at least one of the hips should be attempted. If this is successful the opposite hip may be operated upon at a later date. If the hip and knee of one extremity are ankylosed, an attempt to obtain functional motion in the hip should be made. The ankylosed knee would probably not be enough of a disability to make arthroplasty on this joint necessary if motion is obtained in the hip.

This brief summary would not be complete without at least mentioning some of the most recent work upon the problem. Reference is here made to the sympathetic ganglionectomy[15] introduced by Rowntree and Adson[16] in 1927. The work is highly experimental and remote results have not been observed. Changes in the extremities are chiefly due to the increased blood supply following the abolition of the vasomotor influence on the blood-vessels. Skin surfaces change from the cold, clammy, waxy appearance found in chronic proliferative arthritis to the warm, dry, ruddy complexion of normal skin. Joint

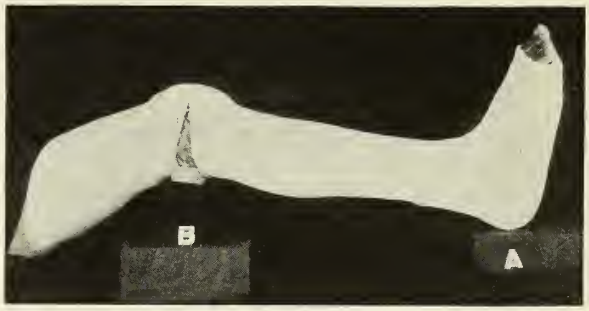


Fig. 4. This illustration shows the use of a plaster-of-Paris wedging dressing. A well padded plaster dressing is applied from the tips of the toes to high up on the thigh, holding the foot at a right angle and the knee in as much correction as can easily be obtained. By splitting the plaster through ⅞ of its circumference at the flexure of the knee wooden blocks of increasing width can be inserted between the edges of the cut in order to overcome the flexion deformity.

pain and joint effusion subside, probably due to the improved circulation. One of the questions which must be decided, however, before much enthusiasm is developed, is the ultimate outcome of the joints themselves. Can we expect to interfere radically with the sympathetic supply to blood-vessels, joints, and other soft parts without producing unfortunate end-results? What are the possibilities of the development of neuropathic joint disease like that found in tabes dorsalis, syringomyelia, and other similar conditions? Is the relief from pain, the comfortable warmth, and decreased swelling a permanent change or is it just a temporary one? It is felt that in carefully selected cases the procedure is worth trying and that efficient after-care and observation will bring many hopeful facts to light.

The treatment of arthritis may be summarized briefly:

1. The persistent search for foci of infection and metabolic and static disorders, and their correction.

2. Improvement of general health by supervised rest, diet, heliotherapy, etc.

3. Alleviation of pain in recently infected joints with local heat, and properly controlled fixation in splints and in the chronically inflamed joints by mechanical or operative fixation.

4. Relief of pain and swelling with increase

of motion in the joints by the use of triple typhoid vaccine to produce foreign protein reaction.

5. Restoration of motion when possible, by active and passive exercise or by operative means.

6. The correction of deformities.

7. Sympathetic ganglionectomy in properly selected cases.

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UNDULANT FEVER*

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UNDULANT or Malta fever is an infectious disease. The infecting organism, known as *Brucella Melitensis,* may be isolated from the spleen, blood or urine. The exact mode of transmission is not known but has occurred from bovine, caprine, porcine and equine sources.

Although some cases may run an acute course and show a high percentage of mortality, yet the typical case is markedly protracted and of chronic or subacute character. The tendency of the febrile accessions to recur after an apyrexial interval accounts for the name undulant fever.

The typical case runs a course of three to four months or longer and the mortality rarely exceeds 2 per cent. Joint pains and neuralgia manifestations are fairly characteristic.

The causative organism, the *Brucella Melitensis,* is sometimes called *Bacillus Abortus* or *Bacterium Melitensis.* The causative organism of undulant fever in man, Malta fever in goats and abortion in cattle cannot be distinguished morphologically or biochemically.

Originally the infection was supposed to come from goats' milk only, but today ideas have changed. Individuals in various occupations contract it. But it seems most common in those who work with live stock, handle meat, or drink raw milk and cream. The method of infection seems to be varied and not infrequently it is impossible to trace the source of infection in a given case.

To date, eighty-eight cases have been reported in this state. Last year forty-two, and so far this year twenty-two have been reported. The increasing distribution of undulant fever suggests that the physicians are confronted with the necessity of familiarizing themselves with the symptomatology of the disease as they may be called upon to diagnose the condition. The fact that it may be transmitted by raw milk gives it geographically boundless limitation.

The diagnosis is by no means an easy matter inasmuch as the complete group of symptoms is not met with at the onset but is established by a slow evolution. The syndrome is incomplete until 5 or 6 weeks elapse from the beginning of the disease. The prodromal symptoms of undulant fever are malaise, anorexia, constipation, vague pains in the limbs, often so slight that the patient hardly notices them. Gradually they become more pronounced and ultimately the headache and interim lassitude compel the patient to forego his occupation and remain in bed. When this stage is reached the temperature is usually around 103 to 104. Most observers state that up to this time there are no respiratory symptoms, so influenza, for which it is frequently mistaken, may be eliminated early.

During the first wave of undulation of the fever the disease may be mistaken for typhoid fever although the two do not run courses that are in any way similar. In undulant fever there is rarely, if ever, any delirium, and constipation is the prevailing state of the bowels. In typhoid fever diarrhea and delirium prevail more often. Then the temperature curve is quite different from that in typhoid. It presents a well defined matutinal remission and the nightly fall of the temperature is invariably followed by more or less profuse sweating. After two or three weeks the diagnosis becomes less difficult and the patient presents nothing suggestive of a typhoid condition. His mental state is perfect in spite of the persistent high temperature; his digestive tract is unimpaired and is, in fact, in a better state than earlier in the attack; he has a particularly good appetite; and finally the Widal is negative and there has been no rash.

After persisting two or three weeks, undulant fever usually recurs and the patient enters the second undulation of fever. Such relapses recur for months and the disease may last for years. Various authors have reported cases in which the diagnosis was made from repeated agglutination tests, which have lasted from eighteen months to two years. Other cases have

*Read at the Sixty-second annual meeting of the Wabasha County Medical Society, Wabasha, Minnesota, July 10, 1930.

been known to terminate in from twenty to thirty days.

The spleen is usually enlarged in undulant fever and becomes palpable below the costal margin. It may be tender to pressure. A slight swelling of the lymphatics of the inguinal and cervical region has been mentioned by some.

Pain and swelling of the joints is present in about one-half of the cases reported. For this reason the disease is often mistaken for arthritis. The joint pain usually resists the medication to which rheumatic pains usually respond, and no tendency to endo- or peri-cardiac involvement exists. It is often hard to distinguish these pains from gonorrheal rheumatism, which they resemble in many respects. Not infrequently the serous exudate into the joints may be extensive and aspirations which have been made have made it possible to demonstrate the specific organism in the fluid withdrawn.

Undulant fever should be suspected in any case with an unexplained fever.

Subacute pyogenic infections are much more difficult to eliminate and a diagnosis may not be possible on the face of the negative blood cultures until embolic signs appear. Acute miliary tuberculosis in the early stages may cause confusion but the detection of old foci, the use of the *x*-ray and the course of the disease will eventually clear up the diagnosis. In this climate, where only the tertian form of malaria occurs, there should be no confusion with this disease. Hidden foci of infection might cause confusion but the blood picture is entirely different in most patients, for in undulant fever we usually have an anemia with a leukopenia, although the blood may be normal.

In about three-fourths of the cases cranial and facial neuralgia, lumbago and sciatica are mentioned in addition to arthritic pains. Some consider that epistaxis is a frequent symptom. Others insist that it does not occur early in the disease but is occasionally seen later in its course and in severe cases hemorrhages from the gums, intestines and even from the stomach have been reported.

Respiratory symptoms are quite common but are by no means constant.

The tongue becomes coated with a yellowish white fur early in the disease. The breath is usually fetid and the patient complains of a disagreeable taste in the mouth. The bowels are constipated.

Few symptoms of the disease suggest anything that may be spoken of as pathognomic, but many insist that the drenching night sweats are more typical than any which have been observed.

A summary of the symptomatology collected from even the recent contributions to the subject seems to suggest that the disease has many features which are atypical and were it not for the fortunate fact that the agglutination test with the dilution of the two organisms capable of producing the disease is available, a diagnosis would be practically impossible.

The eradication of the disease from a naval hospital at Malta by the boiling of the milk points to this important measure in the control of the disease. But it must also be remembered that the disease can be contracted from hogs, cattle, cheese, etc., so we must make an attempt to destroy all animals with the disease. All milk should be boiled or pasteurized. If no other reason existed for the pasteurization of all milk, the increasing prevalence of undulant fever would be an adequate one.

There is no drug that seems to have any influence on the course of the disease. Neoarsphenamine has been reported to be of value. The constipation should be corrected. For the insomnia and pains, hydrotherapeutic measures are indicated. Because of the length of the disease it is necessary to give a diet of sufficient caloric value. Some advise the use of vaccines and others have had no assistance from them.

Because of a mortality of only 2 per cent, there has been practically no autopsy material, so our knowledge of the pathology is not very exact. It is a bacteremia which can be demonstrated by blood cultures. So far as is known it does not cause abortion in women. The incubation period is thought to be about two weeks. It would seem reasonable to suppose that in the intestinal tract might be found the nidus of the infection if the entrance of the bacteria in many of the cases, and hypothetically in all, is by way of the mouth. It has been found by several observers that ulceration occurs in the small intestine in a small proportion of those dying from the acute malignant form. X-ray has shown definite irritability of the large intestine in a chronic case. This case immediately improved

and lost all symptoms when treatment was directed to the intestines. The sickness seems to be caused by the bacteria itself and not by a toxin, for injecting dead bacteria into cattle will cause no disturbance, while the injection of the live bacteria causes abortion.

Blood for examination should be drawn from the vein into a clean, small, empty bottle and sent to the State Board of Health, University Campus, Minneapolis. I use a Wassermann container and label it, "For Undulant Fever Agglutination." The State also examines it for typhoid, para-typhoid and tularemia.

Conclusions:

1. The *Bacterium Melitensis* will produce abortion in cattle and undulant fever in man.
2. The exact mode of transmission is not known.
3. The number of cases is increasing and it is very important that we familiarize ourselves with the various signs and symptoms in order to recognize it.
4. There seems to be no pathognomonic signs.
5. Undulant fever should be suspected in any patient with an unexplained fever.
6. Our knowledge of the pathology is not very exact.
7. The agglutination test as performed by the State Board of Health is the deciding factor.
8. The greatest point in treatment is prophylaxis. All animals harboring the disease should be destroyed. The barns and buildings that housed them should be cleansed, disinfected, and well aired. All milk should be boiled or pasteurized.
9. There seems to be no specific medication, vaccines having proved of little value.

REPORT OF CASE

The patient is a very obese woman of thirty-nine years, who has been enjoying good health until June 30, 1929. The day before, June 29, she went on a picnic and had strawberries and cream. That evening she felt very tired. The next morning, July 1, she awoke with a severe headache and pain throughout her back. She tried to do her washing but had to give it up for she felt so miserable. That afternoon her temperature was 101. At this point she went to bed. She did not feel hungry; her bowels were constipated. She ran this temperature and felt very miserable all week. Each day she thought she would feel better the next day, for she did not feel especially sick but just feverish and miserable.

I saw her first, July 7. At that time she complained of headache, backache, general malaise, a slight unproductive cough, chills and fever, and profuse night sweats. Physical examination showed only temperature 101, pulse 100, flushed face, coated tongue; the urine was normal. The condition remained about the same for several days. The blood Widal was negative but was positive for undulant fever agglutination.

About ten days after the onset the patient had a severe nose-bleed. On July 22 she began to have severe pains in the left leg and it began to swell and was edematous. She ran a fever of 99.5 in the mornning to 102 in the evening for eight weeks. Most symptoms cleared up after about five weeks except the swelling in the left leg, which still persists today to some extent.

This patient never drinks milk, and usually uses cream only in her coffee. She had cream on her strawberries the day before the onset of the disease. The herd furnishing the family with milk was tested and ten of the herd were infected with *Bacillus Abortus.*

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CASE REPORT

ACTINOMYCOSIS OF THE MEDIASTINUM*

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Although infection from actinomycosis is not at all uncommon in man, involvement of the mediastinum is comparatively rare. The following case is therefore of interest, and illustrates some interesting points in clinical diagnosis.

A school boy, H. J., aged 14, entered Fairview Hospital February 3, 1929, complaining of severe cough, swelling of the abdomen, shortness of breath even when sitting up, weakness, fever and sharp pains in the lower left chest.

History of Present Illness.—The boy was always healthy, though never strong, until nine months previous, when he had an attack of pleurisy in the lower left chest, which kept him in bed one month. He had no cough at this time, little if any fever, only severe sharp pains in lower left chest on deep breathing. He seemed to regain his usual health, but about three months later (September, 1929) he noticed a beginning weakness. Soon he noticed dyspnea on exertion with accompanying precordial pain. About December 1, 1929, he suddenly developed a severe irritating cough which never left him, but continued to grow worse. Two weeks later he noted his abdomen seemed enlarged. At Christmas time he had to go to bed because of another attack of pleurisy in the lower left chest. The dyspnea, weakness, precordial pain, cough, and swelling of the abdomen continued to increase up to the time of his entrance to the hospital. He saw several local physicians who treated him for heart trouble without relief of symptoms.

Past History.—He had always lived on the farm, and had never had any serious illnesses, operations or accidents.

Family History.—The father is forty-five years of age, living and well, but has clubbed fingers. The mother died at the age of thirty-eight, probably from pulmonary embolism, as death was sudden following a painful swelling of one leg. Three brothers and two sisters are living and well.

Physical Examination.—General inspection showed a greatly emaciated lad with drawn expression, orthopneic, cyanotic and annoyed by a persistent, dry, hacking cough. The eyes seemed sunken in his head, his pupils were dilated, but reacted somewhat to light and accommodation, were equal and regular. Mucous membranes were pale and cyanotic. Dental caries was marked and the tonsils were large and appeared infected. The tongue was coated and dry. The neck showed marked enlargement of many of the cervical glands, one on the right side being very conspicuous. Axillary and inguinal glands were not enlarged.

Configuration of chest showed a tendency toward the pigeon-breast type with marked depression of the intercostal spaces, and lower part of sternum. Tactile fremitus was somewhat decreased at both lung bases posteriorly, especially on the right side. Percussion over the lungs posteriorly showed fairly good resonance except at the bases and over the spine down to the eighth thoracic. Resonance in front was fair, but a large wide area of mediastinal dullness existed. Broncho-vesicular type of breathing of a very coarse character was generally present over the lungs in front and behind, with several small areas of bronchial breathing in both lungs accompanied by coarse, moist râles. Breath sounds were diminished at both bases with no evidence of passive congestion.

The apex beat of the heart could be seen and palpated indefinitely in the fifth interspace, in the anterior-axillary line. Percussion revealed marked general enlargement of the heart, especially to the right. The heart tones were clear, but weak and distant with a rough systolic murmur heard over the base. The pulmonic second sound was louder than the aortic second tone.

The blood pressure was 85-50; pulse 140.

The abdomen was very prominent and a large mass could easily be seen which filled the entire upper half. This proved to be, on palpation, a very hard, firm, tender liver with rounded edge. The spleen was also enlarged extending down to the level of the umbilicus. The small intestines seemed to be all pushed into a bunch over the lower mid-abdomen. The genitals were normal. The kidneys were not palpable.

The extremities were thin and there was some edema about the ankles. The skin was dry and shiny and the veins over the chest and abdomen were dilated. Reflexes were normal.

During the twelve days' stay at the hospital he ran a constant fever, varying daily from normal to 104 degrees on one occasion. It was of a septic type. The pulse rate varied from 100 to 160, respirations from 24 to 50.

Laboratory Findings.—Urinalysis on February 4 and 7 showed the specific gravity to be 1.029, albumin one plus, sugar none, microscopic negative.

On February 8 the phenolsulphonephthalein excretion was 50 per cent the first hour; 25 per cent the second hour.

Blood examinations were as follows: Feb. 4, R.B.C. 3,750,000; Hgb., 57 per cent (Talquist); W.B.C., 14,400 with 90 per cent P.M.N. Feb. 5, blood smear, 90 per cent P.M.N. Feb. 8, W.B.C., 15,500. Feb. 13, blood culture negative. Feb. 14, R.B.C., secondary anemia

*Read before the Minnesota Society of Internal Medicine, at Duluth, Minn., May 26, 1930.

type; 82 per cent P.M.N. Feb. 16, Wassermann negative.

It was learned at this time that the boy had been in the University Hospital for a few days prior to entering Fairview Hospital. No final diagnosis was arrived at by the doctors there, however, as he left under protest before the examination had been finished. Their impression, however, was that he had a malignant tumor of the liver and a mediastinal tumor, probably lympho-sarcoma.

The first *x*-ray pictures were taken at the University Hospital on January 31, 1929. Dr. Rigler's report was as follows:

1. Mass in mediastinum, probably lympho-sarcoma.
2. Pleural effusion, right.
3. Intra-abdominal mass, probably associated with liver.
4. Bilateral maxillary sinusitis.

On February 5, 1929, *x*-ray pictures of the chest and sinuses were taken at Fairview Hospital, which showed a greatly enlarged heart, a mediastinal mass, and a small bilateral pleural effusion (Fig. 1). There was bilateral maxillary sinusitis. Fluoroscopic study of the chest by the author showed a marked general enlargement of the heart with some preponderance of the right ventricle, as noted in the left anterior oblique position. No enlargement of the auricles was noted. Electrocardiographic study showed a tachycardia (150), right ventricular preponderance, arborization block, grade I, and inverted T_3.

From these clinical and laboratory data, the following diagnoses were made:

1. Cervical and mediastinal adenopathy, probably a lympho-sarcoma or Hodgkin's disease.
2. Mediastinal pressure syndrome.
3. Adhesive pericarditis with constriction of the inferior vena cava, with resulting passive congestion of liver.
4. Passive congestive type of decompensating heart.
5. Bilateral pleural effusion.
6. Low grade type of broncho-pneumonia.
7. Bilateral maxillary sinusitis.

The diagnosis of mediastinal pressure syndrome was made on the presence of an early Horner's sign (stimulating pressure on sympathetics), marked dilatation of the veins in the neck with cyanosis, and the extremely irritating cough. The impression of constriction of the inferior vena cava was based on the clinical findings of extreme passive congestion of the liver with little or no passive congestion in the lungs, in the absence of tricuspid and pulmonary stenosis, which may give similar findings.

The bilateral pleural effusion was explained on the basis of pressure from the mediastinal tumor mass on the hemiazygos and azygos veins.

Removal of a recently enlarged cervical gland for microscopic study was advised, but this was refused.

The condition of the boy continued to grow worse each day. There was little or no response on the part of the heart to digitalis, caffein-sodium benzoate or coramine. The administration of salyrgan in one to two c.c. doses intravenously and euphylin by mouth resulted in moderate, temporary diuresis. Sedative cough mixtures had no effect. On February 11 the temperature reached 104 degrees and the type of breathing changed to that commonly seen in pneumonia. Many râles now were present all over the chest, with several definite areas of broncho-pneumonia. Death ensued two days later.

In view of the previous attitude of the relatives, we

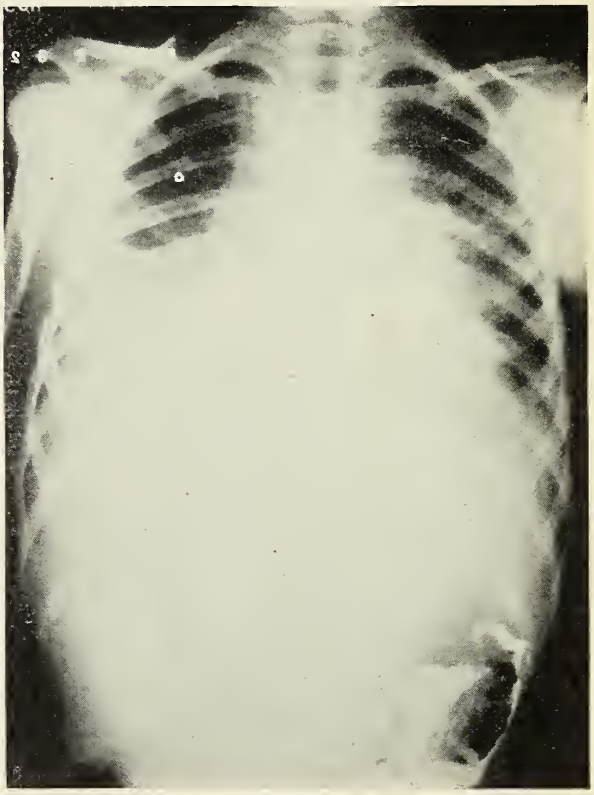


Fig. 1

were delightfully surprised to obtain permission for a post-mortem examination. This was made by Dr. Paul H. Cuttman, and his report is as follows:

"The body is that of a well developed, emaciated white boy, 150 cm. in length and weighing about 85 pounds. Rigor is moderate, there is purplish hypostasis posteriorly, slight edema about the ankles, no cyanosis or jaundice. The pupils are equal, regular and in mid-dilation. The abdomen is very prominent and tense. The veins over the abdomen, chest and neck stand out prominently. There is marked enlargement of lymph nodes in the anterior cervical region.

"The abdominal fat is scant. The abdomen contains about 450 c.c. of clear, straw-colored fluid. The liver reaches 12 cm. below the costal margin in the right mid-clavicular line. The appendix shows a marked kink in its proximal third; it is below the cecum and is not adherent to the surrounding tissues. The diaphragm is at the seventh interspace on each side.

"Each pleural cavity contains about 750 c.c. of brownish fluid containing occasional fibrin flakes. On removing the chest plate numerous pus pockets are en-

countered over the mediastinum. The entire mediastinum and the pleura over the anterior half of the right side and adjacent mediastinum on the left are markedly thickened and indurated. The mass is composed for the most part of a firm, grayish tissue, containing pus pockets varying in diameter from a few millimeters to 2 cm. The thymus is lost in this fibrous mass. The medial surfaces of the lungs, the pericardium and the



Fig. 2

great vessels leading to and from the heart are matted together in this mass. The pericardial surfaces are firmly adherent and cannot be separated. The pericardial space is obliterated.

"The heart is left *in situ* and not weighed. The myocardium is of a light brownish red color and shows no evidence of hypertrophy. The endocardium shows no change. The valves appear normal. The root of the aorta shows no evidence of arteriosclerosis and the coronary orifices are widely patent. The superior vena cava is not obstructed. The inferior vena cava near its opening into the right atrium is reduced to a small diameter by fibrous growth about it; it will scarcely admit the small finger.

"Each lung is markedly atelectatic; crepitation is almost absent throughout. The surfaces are dark purple color. On section the surfaces are meaty and red. The upper and middle lobes of the right lung show increase of fluid and grayish red mottling. A small amount of purulent material can be expressed from the small bronchi.

"The spleen weighs 140 grams. The capsule is fairly smooth. The surface is smooth and of a slate blue color. The substance is soft and brick red; it scrapes readily. The corpuscles are indistinct.

"The liver weighs 1,725 grams. The surface is smooth and of dark purplish color. The edges are slightly rounded. The organ sections with normal resistance and the substance is firm; it shows typical nutmeg appearance throughout. The gall bladder is of normal size and color and contains a stringy greenish bile. The bile passages show no lesions.

"The gastrointestinal tract, pancreas and adrenals show no lesion.

"The right kidney weighs 160 grams, the left 190 grams. The surfaces are smooth. The capsules strip readily. The color is pale grayish red. On section the edges evert slightly. The cortex is pale and cloudy; the medulla is slightly darker; shows no gross lesion. There is no change in the pelvis, ureters, bladder or prostate.

"The lymph nodes about the aorta are increased in size, firm, and grayish white; there is no breaking down of the tissue.

"The aorta is smooth throughout. The organs of the head and neck are not examined."

Microscopic Examination.—The first tissues examined from the lower part of the mediastinum and the pericardium showed marked inflammatory reaction, consisting of connective tissue and polyblastic infiltration; small abscesses containing abundant polymorphonuclears in the center surrounded by connective tissue. This was interpreted as a chronic suppurative inflammatory lesion but, because of the gross peculiarity of the lesion, further sections were made from places showing multiple small abscesses, and these are found to contain small abscesses surrounded by epithelioid cells and connective tissue and containing in the center typical actinomycetes (Fig. 2).

Diagnoses.—

1. Mediastinal actinomycosis.
2. Chronic suppurative pericarditis and pleuritis.
3. Stenosis of inferior vena cava by contraction of scar tissue.
4. Ascites; bilateral hydrothorax.
5. "Nutmeg" liver.
6. Cloudy swelling of kidneys and heart.
7. Septic spleen.

Comment.—Next to the face, the neck is the most frequent site of actinomycosis. The primary lesion is often cicatrized and only scar tissue remains as evidence of the original infection. The disease is not spread by blood or lymphatics, but by continuity. The tissue is destroyed and liquefied, and the picture is one of induration, areas of suppuration, sinuses and fistula formation. Although no definite sign of a previous initial lesion could be found about the face or mouth in this case, there were plenty of enlarged infected cervical glands, which deeply invaded the lower part of the neck. Actinomycosis of the mediastinum is always secondary, and from these deep-lying glands the infection extends along the loose connective tissue of the sheaths of the great vessels to the mediasta.

Most authors agree that involvement of the anterior mediastinum is rarer than that of the posterior. In my case the entire mediastinum was involved. Extension is usually first to the posterior mediastinum. Through the mediastinum, extension may occur to the pleuræ, lungs, heart and pericardium. Because of improper drainage from these deep parts, the disease is very serious when involving any of these structures. According to reports in the literature, diagnosis is rarely made antemortem. I believe a diagnosis would have been made in my case if a cervical gland could have been removed. However, the condition should have been thought of and considered in view of the boy having lived in the country on a farm, and exhibiting such extensive involvement of his cervical glands. He exhibited what has been called the neoplastic type which is characterized by an abundant proliferation of connective tissue which, without the presence of mycelium, is difficult to differentiate from round cell sarcoma. However, when the actinomycotic nodule broke down, small abscesses were found containing pus and the characteristic yellow granular bodies. These were fairly numerous substernally and in the posterior mediastinum.

Tuberculosis and syphilis are usually considered in the differential diagnosis of actinomycosis, but in my case, lympho-sarcoma and Hodgkin's disease were also included. The presence of a polymorphonuclear leukocytosis should have directed me to a suppurative process other than tuberculosis. The absence of a draining sinus made the diagnosis more difficult. Van Den Wildenberg refers to a complement deviation reaction as a means of diagnosis, because the serum of the person with actinomycotic parasitosis contains specific antibodies.

The diagnosis once established, treatment should consist first of a trial with large doses of potassium iodide internally and injected into the infected areas in strengths of 1 per cent. This has cured many of the superficial cases. The drug is not a specific in the true sense of the word, but acts rather on the neoplastic tissues causing them to undergo a rapid breaking down and thus more quickly to establish drainage to the surface. Other methods advised are deep roentgen-ray therapy, autogenous vaccines and Yotren.

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PRESIDENT'S LETTER

A CONSIDERABLE number of years ago there was a great deal of agitation over child labor conditions, particularly as they obtained in the south. This resulted in Maternal and Child Hygiene legislation by the national legislature. The object of such legislation was to control and abolish child labor. Though commendable in purpose the supreme court ruled that the law was unconstitutional inasmuch as it attempted to regulate matters that properly belonged under state rather than national control.

The next legislative action attempted to get control of the situation by taxation. When this law was carried to the U. S. Supreme Court the same ruling was handed down as in the case of the preceding law. The next step was the enactment of the Sheppard-Towner Maternity and Infancy Act, approved November 23, 1921. This law sought to evade the constitutional strictures placed upon the two preceding laws by offering to purchase, from individual states, the privilege to coöperate with them in providing for the health and well-being of mother and child. Incidentally provision was made for conditions to which each state desiring federal aid in the management of its own affairs would be obliged to subscribe in order to obtain the proffered financial aid. Thus was Federal domination of state activities insured to the national government. All of this legislation was endorsed by the U. S. Department of Labor and the administration of it was placed in the hands of the Children's Bureau of that department. The supreme court has never had occasion to rule upon the constitutionality of the Sheppard-Towner Act.

The chief objection to this act is that, in spirit, it violates certain constitutional guarantees which delegate to the several states, rights and obligations to regulate affairs that are clearly within the province of each state. The act is primarily a labor law masquerading as health legislation and diverted in its administration to the promotion of the health and safety of women in pregnancy and confinement as well as to the health and safety of the new-born. No one can complain of the purposes of this law, either in conception or operation. The law meets with opposition, as stated above, on constitutional grounds. Also because it seeks to transfer the practice of medicine from the individual to the hands of the state; from professional influence to lay domination; from the unbiased guidance of science to that of a centralized political bureau. Inasmuch as the Sheppard-Towner Act and similar laws seek to lower maternal and infant mortality it is only right that we should know the mortality rate and if it can be lowered. Without submitting figures it may be stated that the present rate is very much too high and that it is due to almost entirely preventable causes, namely eclampsia and infection. It has been stated by reliable authority that maternal deaths from these two causes alone can be reduced by at least two-thirds.

Question.—Is the medical profession going to effect this reduction? If it is not going to answer this question in the affirmative let it acknowledge its insufficiency and its indolence, accept Sheppard-Towner legislation with all its iniquities, and permit the state to demonstrate its superior ability. Our prospective mothers are entitled to every safeguard and protection in the crowning hours of their existence. If we will not do our full duty let us not complain if the public does it for us.

It is high time that we awaken to our responsibilities in relation to maternal welfare. These responsibilities are not collective only, they are also individual. Every doctor in every city, village, hamlet and cross-roads should strive, and strive earnestly, to prevent these death dealing afflictions to which maternity is exposed. No effort should be spared, no opportunity lost, by any doctor to teach his people the value of prenatal care. Every doctor knows the conditions leading to infection and he knows how to prevent or correct them; he knows the signals of approaching eclampsia and he knows how to avert the danger. Let each and every one, whether specialist or general practitioner, act on this knowledge and so reduce the maternal death date.

We are charged with the responsibility of safeguarding our women through maternity. We must prove ourselves worthy of our trust. Whereas the state seeks to make an organized effort to do this work, we fail to do so. We take an active and organized part in heart problems, lung problems and economic problems, and now why not in obstetric and maternity problems? The prevention of maternal sickness, misery and death is an inviting field, offering great possibilities and glorious reward. Every component society in the state should organize an educational movement of this kind. It would be well if the University Extension service, obstetric societies and the State Medical Association would coöperate in putting such an educational movement into effect.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

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INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION

The attention of Minnesota physicians is again called to the meeting of the Inter-State Postgraduate Medical Association which takes place in Minneapolis this month.

The scientific program is already in the hands of our members and speaks for itself. The quality of the clinics and addresses can be judged from the names of foreign, Canadian and American leaders that appear in the program. Those who attended the Saint Paul session in 1925 or other former meetings of this Association know what to expect. Almost without exception the program will be furnished by professors or associate professors from medical schools here and abroad.

Five strenuous days of clinics and addresses have been planned. The program will begin at 7:30 each morning and will continue morning, afternoon and evening until the banquet on the evening of the last day.

As at former sessions, the association meets as a unit in one general assembly where subjects of general interest will be presented. In this respect the Association differs somewhat from the A. M. A. meetings and is meeting a distinct demand, as evidenced by the rapidly increasing attendance at its meetings in recent years. The meeting, as the name signifies, is in the nature of a post-graduate course and a lot of authoritative information will be crowded into the five day session. To be a well informed physician the specialist as well as the general practitioner needs this sort of instruction.

PHYSICIANS AND ADVERTISING

Advertising is contrary to the code of medical ethics. The same rule applies to all professions and this is one of the outstanding differences between a profession and a business. While the physician is perforce dependent upon his fees for his livelihood, monetary return is not and should not be the prime consideration. Advertising smacks too much of a purely business proposition.

In a recent editorial the *Minneapolis Journal* takes the profession to task for not changing its code of ethics regarding advertising. The editor thinks we should use this same tool which quackery has so misused and that the public suffers because we fail to inform them as to what we have to offer for the alleviation of physical ills. We cannot agree that the public would be better served if physicians began to advertise.

The physician depends on the quality of service rendered to increase his practice. Of course

there are a number of modifying factors which affect the size of a practice such as personality, association, medical jobs, etc., in addition to scientific ability. Would advertising be of benefit to the public in assisting the able and not the inefficient physician to increase his clientele? We think not.

What would we advertise? Our specialties? Then how about the general practitioners? The diseases we can cure? This presupposes a diagnostic ability on the part of the patient. Or perhaps we should publish our faces? Not so good.

Obviously the newspapers would all favor the adoption of advertising by physicians. How about increasing the cost of medical service? The prohibition of advertising places no physician at a disadvantage.

Most publicity amounts to advertising. This is the reason that the physician to be consistent is inclined to sidestep publicity. This does not mean that the public is deprived of medical information. What with health journals such as *Hygeia* and the *Public Health Journal,* radio broadcasting by national and state medical associations and health articles in newspapers and magazines, the intelligent reader can easily keep posted.

The newspapers themselves are to a certain extent to blame for the usual reticence on medical matters encountered by them. Information, when given, is likely to appear in a distorted, sensational write-up featuring the individual rather than the subject matter. The public is interested in individuals rather than abstract facts, we are told.

Medical groups—so-called clinics—are bound by the same rules of ethics as individual physicians. Articles sometimes appear without the sanction of the individual physician or the group, but not infrequently a group utilizes publicity methods or even solicits patronage in a manner that would be severely criticized in an individual. A hospital sometimes advertises and incidentally the medical group which owns or patronizes the hospital receives publicity. A hospital, in our opinion, should not be operated as a money-making proposition and therefore should not resort to advertising in lay magazines or newspapers.

No, we can see no reasons for changing the status quo of medical advertising and there are many reasons why we should continue to play the game according to the present rules.

MOMENTS OF REST

Men do die of overwork. The young engineer, Holland, and his successor, Freeman, both died probably of overwork during the construction of the Holland tunnel under the Hudson River. The way a man spends his hours away from the office, however, is the theme of this discussion.

Competition was never more strenuous. It becomes apparent in pre-college days, is severe in undergraduate days and becomes most intense in business and professional life. Happy is the individual who learns early how to spend his hours while away from work so as to conserve his energy.

Hobbies are a great asset. But Lord Dawson was right when in a recent address at Winnipeg he warned against the danger of overdoing even the game of golf. He believes many a middle aged man is better off with one round of golf over the week end with plenty of rest, rather than with three rounds and little or no physical relaxation.

How many men return from a so-called hunting trip refreshed? The unaccustomed physical exercise, lack of sleep, and excessive indulgence in drinking and smoking, so commonly accompaniments of an outing, all tend to drain reserve and leave the individual susceptible to infection.

Vacations should be taken by everyone. And yet how often they are spent in ways that are tiring rather than restful. A nerve-racking run may be made by auto across the country or the vacation may be made to assume the nature of a celebration rather than a vacation.

Daily routine which provides for proper physiological rest is most important. The busy man realizes the importance of early to bed. The present day party that begins at bed time and ends at the usual rising hour is a man killer and incompatible with serious work.

The busy man can well afford to break the day by taking the full noon hour for lunch and relaxation, or by even going home for lunch and resting a few minutes after the noon meal. A few are even able to snatch a few minutes of refreshing sleep before returning to the fray.

When middle age is reached, the type of exercise may well be modified. The man following a sedentary occupation is better off if he leaves the more strenuous forms of exercise alone.

Sudden death in the forties from heart disease seems to be on the increase. It certainly has been called to our attention most strikingly of late.

This must be the result of unnecessary wear and tear on the human organism and sclerotic coronary arteries are at the bottom of many of these tragedies.

Shall we eat, drink and be merry for tomorrow we die, or shall we use a little more common sense?

OF GENERAL INTEREST

Dr. H. B. Bayley, formerly of Ceylon, Minnesota, has moved to Fairmont.

Dr. Willis Herbert is practicing at Maynard, Minnesota, following an interneship at St. Mary's Hospital, Minneapolis.

Dr. Philip A. Halper has moved from Saint Paul to Chicago, where he has opened offices at 30 North Michigan Avenue.

Dr. Herbert K. Kent, who completed his interneship at St. Barnabas Hospital, Minneapolis, recently, has located in Portland, Oregon.

Dr. Harlan Alexander has recently become associated in practice with Dr. H. M. Lee in the Physicians and Surgeons Building, Minneapolis.

Dr. Phil Quilling, following his interneship at Asbury Hospital, is assistant to the surgeon for the Great Northern Railroad at Marquette, Michigan.

Dr. Junius Smith, following interneship at St. Barnabas Hospital, Minneapolis, this year is a member of the Medical Corps of the United States Army.

Dr. H. Paul Johnson has established offices at Seventh Street and Eight Avenue South, Minneapolis, for general practice. Dr. Johnson did his interne work at Asbury Hospital.

Dr. Evelyn McLane, who completed her interneship at Asbury Hospital, Minneapolis, this year is associated in general practice with her husband, Dr. Will McLane, at Sleepy Eye, Minnesota.

Dr. N. J. Berkwitz is no longer associated with Dr. W. A. Jones of Minneapolis. He has recently opened a private office in the Medical Arts Building and is limiting his practice to nervous and mental diseases.

Dr. James R. Kingston has located at Grand Rapids, Minnesota, where he is engaged in general practice. Dr. Kingston was an interne at the Abbott Hospital, Minneapolis, where he completed his course July 1.

Dr. E. J. Borgeson of Minneapolis addressed the Chisago-Pine County Medical Society, August 26, at Pine City, on "Diagnosis and Treatment of Chronic Sinus Infections." Dr. C. G. Kelsey of Hinckley read a paper on "Eczema of the Scrotum."

Dr. Sherman Stenberg, who recently completed his interneship at St. Mary's Hospital, Minneapolis, has been practicing in Sisseton, North Dakota, doing relief work for a local practitioner there. He is planning to establish a practice in Hudson, Wisconsin, later.

Dr. J. Allen Wilson has become associated with the Earl Clinic, Saint Paul, after a year spent under Dr. Ralph Brown in gastro-intestinal work at the Presbyterian Hospital in Chicago. The preceding year Dr. Wilson interned at the Ancker Hospital, Saint Paul.

Word has been received of the death of Mrs. Alice Hanson Magnuson, wife of Dr. Paul Magnuson of Chicago. Both Dr. and Mrs. Magnuson lived in Saint Paul before Dr. Magnuson took his medical course and located in Chicago, where he became interested in surgery.

Dr. and Mrs. Clifford E. Alexander of Duluth have left for an extended visit to Vienna and other European clinics, where they expect to remain for about ten months. Dr. Alexander's practice at Duluth is being cared for in his absence by members of the Arrowhead Clinic, of which Dr. Alexander is a member.

Dr. William C. Wright and Dr. Richard L. Hane, formerly associated with The Mayo Clinic, Rochester, have announced the opening of offices in the Medical Arts Building, Fort Wayne, Indiana. Dr. Wright is limiting his practice to general and urological surgery; Dr. Hane to general surgery and surgery of the thyroid.

Dr. Arthur C. Strachauer sailed from New York, September 23, on the steamship Bremen for a tour of Europe and the Orient. He will visit the important surgical and cancer centers at Berlin, Vienna, Munich, Paris and Rome. On the return voyage he will stop at Bombay, Shanghai, Pekin and Honolulu, and will arrive in Minneapolis about April first.

Dr. Leo G. Rigler, with his associates, was awarded the Southern Minnesota Medical Association medal for the best scientific exhibit at the annual meeting of the Minnesota State Medical Association held at Duluth in July. The exhibit, which won the award from the standpoint of originality, practicability and manner of presentation, was a demonstration by roentgenograms of free and encapsulated pleural effusions.

Of the internes who completed their work at St. Mary's Hospital, Duluth, the past year, the following have established practice in the towns and cities mentioned: Dr. Warren Fetterly, Medical Arts Building, Minneapolis; Dr. E. E. Zemke, Fairmont, Minnesota; Dr. O. E. Sarff, Baudette, Minnesota; Dr. W. A. Stafne, Fargo Clinic, Fargo, North Dakota; Dr. N. Lende, Faribault, Minnesota; Dr. R. R. Sullivan, State Department of Health, University Campus, Minneapolis; Dr. V. J. Telford, Edgerton, Minnesota.

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—Please outline the treatment for a case of syphilis in the secondary stage. The patient has not had any previous treatment.

   Answer.—The first course of treatment consists of twelve Bismogenol injections of 1 c.c. each into the muscles once every five days. Five days after the last treatment has been given, the neosalvarsan intravenous injections should be started. Give six treatments of not more than .6 grams each one week apart. Three such series of treatments are given the first year, and two in the second and third years.

2. *Question.*—I wish to purchase a carbon dioxide snow apparatus for the treatment of warts. I will probably not use it more than once a month. Please tell me about the least expensive apparatus I can purchase for this purpose.

   Answer.—To make carbon dioxide snow pencils it is necessary to have a tank of carbon dioxide, which is purchased but may be exchanged for another tank, and an adapter for the end, which is a separate piece of apparatus. If you do not intend to use carbon dioxide snow very much, why not get a small cautery? Warts may be treated in this way very successfully. In addition the cautery may also be used for other purposes, including a cauterization of the cervix in cases of chronic cervicitis. This is a splendid way, according to available knowledge of preventing many cases of malignancy of this structure.

3. *Question.*—Again I am taking advantage of your new and convenient department to ask some assistance in a distressing case. A Jewish boy of about twenty-five years has very painful feet which he describes mostly as "burning like fire." When I first saw him I noticed a large amount of callus, which I removed with no apparent benefit. I have had him using tannic acid and it has been of no effect. There is no apparent localized tenderness as in a frank metatarsalgia and no localized flushing as one would find in erythromelalgia. There is no great amount of sweating and, in fact, the most characteristic finding is the normal appearance of the feet. Yesterday I gave him some luminal in Porter's solution, which is a modification of the lead and opium wash and, of course, I do not know what will come of this.

   Answer.—Indefinite burning pain in the feet of any young adult requires a careful examination to rule out possible circulatory disturbance. The fact that this boy is Jewish would make such an examination almost imperative as a diagnostic procedure. I would suggest that the patient be stripped and placed in a sitting position on the edge of a table and palpation of the posterior tibial and dorsalis pedis arteries be carried out bilaterally with an estimation of the pulse pressure by palpation. They might be compared with the radial arteries. With the knees flexed and the muscles relaxed the popliteal artery should be palpated. With the feet dependent, cyanosis or reddening should be noticed. The patient should then lie down and the feet be slowly elevated. If they blanch before they have reached 45° elevation poor circulation is probable. If the patient then contracts all the muscles of the feet (making a fist, so to speak) with the feet elevated, the finger of the examiner can block the posterior tibial artery behind the internal malleolus. Then the patient sits up and hangs the feet over the edge of the table with the artery blocked and an observation is made of the rapidity of returning circulation in the toes, especially the great and second toes. If these remain blanched, there is probably peripheral blocking of the collateral arteries. If there is a history of claudication or cramps in the calf muscles after exercise plus any of the simple examination findings above, I should be very suspicious of endarteritis obliterans, or Buerger's disease. The treatment of this condition depends upon its severity. If there is a spastic element, that is, incomplete blocking, but marked vasomotor changes of a transient but painful character, lumbar sympathectomy is indicated. The indications, however, are dependent upon circulatory efficiency tests measured by special thermometers after foreign protein temperature shocks. Needless to say, protection of the extremities from over-exertion, strain, or irritation of any type is essential. If the case is not serious, good temporary results often occur following the use of intravenous injection of typhoid vaccine in doses of 50 million to 150 million at 4 day intervals over a period of three weeks. Twenty-four hour hospitalization is necessary for each dose, and the good effects require a rather marked temperature rise.

   Other diagnostic possibilities are:

   1. Raynaud's disease. Patients with this condition are usually females and the attacks are provoked by cold. You did not state in your question what produced the pain or whether it was constantly present.

   2. Peripheral neuritis. This is usually unilateral and involves either the peroneal or saphenous nerves.

   3. Verruca plantaris under the calluses. They would cause a great deal of discomfort and may be found by examining the surface after the calluses are removed.

   4. Arsenical dermatitis might produce lesions, but there would be a history of the drug.

   The consensus of opinion seems to be that the patient has a vascular disease, and the most likely type is Buerger's disease.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Indian Doctor Given Sixty Days in Jail

State of Minnesota *vs.* Starr

On August 26, 1930, Lester Starr was arrested at Spring Grove, Minnesota, charged with practicing healing without a Basic Science certificate. The defendant was a member of a group of Indian doctors who were selling roots and herbs in Fillmore and Houston Counties for the past two months. Their charges ranged from ten to sixty dollars per person and it has been conservatively estimated that they took in $4,000 during the time they were in that vicinity. The defendant waived his preliminary hearing and was held to the District Court under bond of $1,500, which he was unable to furnish. On September 9, Starr entered a plea of guilty before the Hon. Karl Finkelnburg, Judge of the District Court. The Court sentenced the defendant to sixty days in the Houston County jail. The Court denied a plea for a suspended sentence, which means that the defendant will have to serve his time.

Excellent coöperation was received by Mr. Brist, representing the State Board of Medical Examiners, from William E. Flynn, County Attorney, and Arthur C. Brown, Sheriff. It is also felt that Judge Finkelnburg is to be highly commended for his fair but firm attitude in dealing with people who go around the community preying on the sick and extracting their money through this type of swindle.

Unlicensed "Doctor" Fined $300.00

State of Minnesota *vs.* Knapp

On August 18, 1930, J. Knapp, 65 years old, of 522 South Eighth Street, Minneapolis, and 7 E. Tenth Street, St. Paul, was fined $300 or three months in the Workhouse by the Honorable J. C. Michael, Judge of the District Court of Saint Paul, for practicing medicine without a Basic Science Certificate. Defendant paid the fine.

Knapp had been posing as a specialist in rheumatism, nervousness and stomach disorders. He claimed to have a cure for all stomach ailments except cancer. He has been operating in St. Paul and Minneapolis over a period of the last five or six years. The defendant is a man with no medical education and has followed the barber and painting trades during his lifetime.

The case was handled by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners and splendid coöperation was received from C. D. O'Brien, Jr., County Attorney of Ramsey County, in effecting a speedy disposal of this case.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of October will be as follows:

October 1st—Finish the Job
October 8th—Cancer of the Rectum
October 15th—Father of Medicine
October 22nd—Food Fads
October 29th—Finger Infections

INTER-STATE POST-GRADUATE ASSOCIATION OF NORTH AMERICA

Minneapolis Auditorium

October 20 to 24, inclusive

Officers of the Association

President—Dr. William D. Haggard, Nashville, Tennessee

Presidents of Clinics—Dr. William J. Mayo, Rochester, Minnesota; Dr. Charles H. Mayo, Rochester, Minnesota

President-Elect—Henry A. Christian, Boston, Massachusetts

Managing Director—Dr. William B. Peck, Freeport, Illinois

Executive Secretary and Director of Exhibits—Dr. Edwin Henes, Jr., Milwaukee, Wisconsin.

Treasurer and Director of Foundation Fund—Dr. Henry G. Langworthy, Dubuque, Iowa

Speaker of the Assembly—Dr. George V. I. Brown, Milwaukee, Wisconsin

Chairman of Program Committee—Dr. George W. Crile, Cleveland, Ohio

The meetings will be held under the supervision of the Hennepin County Medical Society, Dr. E. L. Gardner, president, and Dr. E. W. Hansen, Secretary.

The Executive Committee consists of Dr. N. O. Pearce, general chairman, and Dr. J. C. Litzenberg and Dr. James S. Reynolds, general vice-chairmen.

The following local committee chairmen have been appointed:

Dr. F. A. Erb—Auditorium
Dr. A. T. Mann—Banquet
Dr. Claude J. Ehrenberg—Entertainment
Dr. J. S. Reynolds—Finance
Dr. Angus W. Morrison—Foreign Guests
Dr. W. A. Fansler—Hotels
Dr. R. O. Beard—Publicity

(Continued on Page 727)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

For Better Newspaper Medicine

Dr. Gilbert Seaman of Milwaukee Suggests a Cure for Editorial "Double Pneumonia"

Most physicians concede, nowadays, that they have a definite obligation to educate the public in matters of personal hygiene, public health and preventive medicine.

Official agencies for the dissemination of authoritative information in these matters are growing. They are the accredited organs of organized medical societies and no one doubts that the good they are capable of doing is incalculable both for the lay public and the doctor.

But the doctor must not consider that his public obligations end with these services, in the opinion of Gilbert Seaman of Milwaukee.

Newspapers still deal in "double pneumonia" and deaths from indiscriminate "ptomaine poisoning," to mention only minor medical delinquencies. They are still occasionally given to distorting medical facts and distressing individual physicians for the sake of human interest "features."

Dr. Seaman urges a better coöperation between the doctor and the editor in a pertinent and interesting paper called "The Doctor Looks at Journalism," read in Milwaukee recently. The editor, and, through him, the public, is entitled to the real facts of scientific medicine.

"Whether or not the doctor is practicing in private or public hospitals or in private practise, he is a servant of the public and should take an active interest in the dissemination of accurate medical information," says Dr. Seaman.

"The whole scheme of preventive medicine depends upon education of the public. You cannot drive people to protect themselves against disease. They must have accurate information on medical matters even when these matters are incidental to the day's news. The newspaper's business is to furnish news in which the public is interested, and this the newspaper man knows how to do. But it is not necessary to distort medical news to do it.

"There must be a better understanding between the press and the medical profession. Ready sources of medical information should be provided by medical societies, colleges and libraries.

"Too often the personality of the doctor and not the essential medical facts are the theme of a newspaper story. The press is not entirely guiltless in arbitrarily putting the wrong emphasis on its medical news. But it is a fact that far too often this tendency to distort and play upon the human interest element is due to complete ignorance of the medical facts, coupled with complete inability to get at those facts.

"A proper well established channel of information between the editor and local medical profession would do a great deal to avoid such things. It would operate, also, to prevent the publication of much news that is unsuitable from the standpoint of the medical profession."

(Continued from Page 725)

Dr. C. B. Wright—Reception
Dr. O. S. Wyatt—Registration
Drs. W. A. O'Brien and E. F. Robb—Scientific Exhibits
Dr. E. C. Robitshek—Transportation
Dr. James M. Hayes—Clinics
Mrs. Emil Geist—Ladies

The International Medical Assembly is the opportunity of a week's intensive graduate study in Medicine, presented by the Inter-State Postgraduate Medical Association of North America. It is to be held this year from October 20th to 24th, inclusive, at the Minneapolis Auditorium.

The Association is unique, among medical organizations, in respect of the fact that aside from a few life members, it has no regular membership. Under a registration fee of $5.00 any physician in good and regular standing, in the American and Canadian Medical Associations, and their component parts, is a member of the Assembly, for the purposes of this meeting. He does not become, thereby, a member of the Association. Life-members are exempt from the registration fee. They will present their life membership cards. The courtesies of the Assembly are extended to Army, Navy, Marine Corps and Veterans Bureau officers, and to full-time officers and officials of local, State and National Public Health Services, upon presentation of their credentials. All physicians should come prepared to show their County, State or National Society Membership cards.

A registration bureau will be set up at the Hotel Nicollet, on Sunday morning, October 19, and local physicians of City, County or State are requested to register in advance of the meeting. Local committeemen are asked, also, to register in advance of the opening of the Assembly.

The Main Registration Bureau will be placed at one end of the Exhibit Hall on the lower level of the Auditorium. It will open on Monday morning, October 20, 1930, in season for the first session of the assembly. On and after this date all registration will be conducted in this Main Registration Bureau. Ladies will be asked to register at a special bureau and distinctive badges will be issued to the men and the women.

All physicians must register.

The plan of program for the International Medical Assembly is as unique as its membership plan. The opening session of the Scientific Program will begin promptly at 7:30 o'clock, Monday morning, October 20, 1930. The organization is essentially a hard-working one. This early morning hour will mark the rising bell of business for the Assembly each day. The morning hours of the entire meeting will be occupied by a succession of diagnostic clinics. There will be an intermission at noon, presumably for luncheon, but it will be immediately followed, at an unstated hour, by two or three more diagnostic clinics.

The afternoon scssions will be devoted to a series of addresses. Both morning and afternoon meetings will be broken by intermission to permit of visits to the Technical and Scientific Exhibits. Evening sessions on each day, excepting Friday, October 24th, will be held, at which a number of addresses will be given.

In the four days' meeting, 38 diagnostic clinics, 84 addresses and 118 exhibits will be presented. The program could hardly be more compact, while practically every branch of medicine and surgery is covered by its papers.

It is the aim of the Inter-State Postgraduate Medical Association, in its annual International Assemblies, to present to the Medical Profession every well-validated advance in medical science and every approved product of research related to it.

It devotes itself exclusively to post-graduate medical education. It exercises no political influence. It enters into no legislative activities.

Every physician of the Twin Cities and of the state at large is invited to share the outstanding values of these meetings of the International Medical Assembly. Set aside this week for a visit to Minneapolis and spend it at the Auditorium!

ANNOUNCEMENT EXTRAORDINARY

One of the outstanding events of the coming Inter-State Post Graduate Medical Association meeting in Minneapolis will be the banquet at the Nicollet Hotel. Friday evening, October 24. On the speakers' program will be many distinguished guests, both lay and medical, some of whom have come a great distance from different parts of the world.

The banquet at the Saint Paul meeting of this organization some years ago has often been commented upon as having been the best in the history of the Association and it is naturally desirable that the Northwest should covet such distinction in an equally or even more successful occasion in Minneapolis. In the promotion of such success the physicians of the entire Northwest are earnestly requested to assist.

Physicians may bring their wives and it is expected that some interested laymen will want to attend. The available seating being limited, those desiring to attend are requested to make reservations early by sending a check for cover charges at $5.00 a plate to Dr. A. E. Hedback, chairman of the Ticket Committee, care of Hennepin County Medical Society, Medical Arts Building, Minneapolis.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Southern Minnesota Medical Association held in Mankato August 25, the following officers were elected:

Dr. J. T. Schlesselman, Mankato, president
Dr. I. W. Steiner, Winona, first vice-president
Dr. P. F. Holm, Wells, second vice-president
Dr. M. C. Piper, Rochester, secretary-treasurer

One hundred and fifty-one physicians registered at the meeting and fifty-three new members were taken into the Association.

Dr. R. T. Westman of Cloquet was awarded the medal for the medical student at the University show-

ing the highest degree of proficiency in clinical fields of medicine and surgery during junior and senior years.

Dr. L. G. Rigler of Minneapolis was awarded the society medal for the best display in the scientific exhibit at the State Medical Meeting at Duluth in July.

AMERICAN PUBLIC HEALTH ASSOCIATION

The 59th annual meeting of the American Public Health Association will be held in Fort Worth, Texas, October 27 to 30.

Public health workers of Canada, Mexico and Cuba, as well as those of the United States, will contribute to the extensive program arranged. Among the speakers will be the president of the Association, Dr. A. J. Chesley, of Minnesota, and the president-elect, Dr. Hugh S. Cummings, Surgeon General of the Public Health Service.

Among interesting features arranged in connection with the meeting are a Texas barbecue and a rodeo. Special trips to Austin, San Antonio and to Mexico City have been arranged. Further details may be obtained from Homer N. Calver, Executive Secretary of the Association, at 370 Seventh Avenue, New York City.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Dr. B. S. Adams of Hibbing was elected president of the Northern Minnesota Medical Association at the closing session of its annual convention at Moorhead Minnesota, September 20. Other officers chosen, in addition to Dr. Adams, who succeeds Dr. H. C. Cooney of Princeton, are Dr. G. S. Wattam of Warren, vice president, and Dr. O. O. Larson of Detroit Lakes, secretary-treasurer.

Hibbing was chosen as the convention city for 1931

SCOTT-CARVER COUNTY MEDICAL SOCIETY

On August 12, 1930, the Scott-Carver County Medical Society met at Dr. F. Buck's cottage on Prior Lake. Dr. Reuben Johnson was the principal speaker and gave an address on "Serum Reactions." It was decided to hold the next meeting at Waconia in September, in charge of Dr. H. D. Nagel.

B. H. Simons, *Secretary.*

VIOSTEROL OR IRRADIATION

If rickets is the disorder that is to be cured or averted, both cod liver oil and irradiated ergosterol, the latter now available as viosterol in oil 100 D, act as specifics; so that irradiation with artificial light sources is not essential though its effectiveness to accomplish the same ends deserves emphasis. Viosterol also serves to promote the proper metabolism of calcium and phosphorus in other disorders. On the other hand, irradiation with ultraviolet rays doubtless produces a variety of physiologic effects about which we are still largely uninformed. (Jour. A.M.A., February 22, 1930, p. 580.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minn.

Arthur C. Dean, M.D.
Hot Springs, S. D.

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minn.

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minn.

MEDICINE

F. J. Hirschboeck, M.D.
205 West Second Street
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Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

A. U. Desjardins, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

Donald K. Bacon, M.D.
456 Lowry Medical Arts Bldg.
Saint Paul, Minnesota

Verne C. Hunt, M.D.
Mayo Clinic
Rochester, Minnesota

EYE, EAR, NOSE AND THROAT

ABSCESS OF THE BRAIN FROM THE STANDPOINT OF THE OPHTHALMOLOGIST: Wm. L. Benedict (Trans. of the Amer. Acad. of Oph. and Otolaryng., 1929, p. 52). The history of the onset of the pathologic process is very important as none of the ocular signs or symptoms are pathognomonic. Even then we must also consider extradural abscess, osteomyelitis of the skull, and tumor of the dura with softening or hemorrhage, as these are conditions which may occur concomitant with diseases of the sinuses or mastoid.

The development of brain abscess may be divided into three stages: (1) the initiatory stage, characterized by severe pain in the head, vomiting, rigor and fever; (2) the second stage, characterized by pain in the head (which can be elicited only by percussion), slow cerebration, want of sustained attention, apyrexia, slow pulse, paralysis and optic neuritis; (3) the third stage, wherein there is leakage of pus into the membranes or ventricles, accompanied by fever, convulsions

and coma; or else there is complete encapsulation of the abscess, which may become quiescent for a long period and may finally become absorbed, in some cases without surgical interference.

The most common sign found is choked disc, occurring in about one-third of the cases. While the abscess is developing, the choked disc fluctuates in appearance, becoming stationary when the abscess becomes encapsulated. At this time surgery should be undertaken. Choked disc usually appears bilaterally, but the edema on the two sides is frequently of different degree. This does not greatly help in localization as it may be advancing on one side and receding on the other. In certain lesions of the frontal lobe, direct pressure may cause atrophy with or without previous choked disc.

Peripheral vision changes have the same significance in brain abscess as they have in brain tumor. The most characteristic alteration is hemianopsia and is dependent on the site of the lesion. Homonymous hemianopia appears in temporal lobe abscesses if they are subcortical and affect the optic radiations. It is also found in lesions of the occipital lobe. Characteristic field changes are rare in frontal lobe lesions.

Nystagmus, which may be horizontal, vertical or rotatory, is particularly common in cerebellar abscesses.

Signs of partial paralysis of the third nerve are most often associated with abscess of the temporal lobe and nearly always with choked discs. Paralysis of the sixth nerve has no localizing value.

L. G. Flanagan, M.D.

PEDIATRICS

THE USE OF PHENOBARBITAL IN INFANT FEEDING: E. J. Barnett, M.D., Spokane, Wash. (Arch. of Ped., Vol. XLVII, No. 7, July, 1930). Phenobarbital in infant feeding is much more valuable than is ordinarily known. The use of phenobarbital has become almost routine with us, not only in cases of pyloric stenosis and pylorospasm, but also in infants suffering with severe colic.

The "vomiting center" in the brain must be involved in pyloric stenosis, otherwise it would be difficult to explain why phenobarbital is apparently so specific for the control of the projectile vomiting. The "vomiting center" in cases of pyloric stenosis must become more sensitive from gastric irritation of the vagus or sympathetic nerve endings, and vomiting results.

The extensive use of atropine in pyloric stenosis and colic has usually been justified on its value as an antispasmodic. It is quite possible that atropine has the same effect as phenobarbital on control of vomiting by its impairment of the afferent emetic impulses along the vagus to the "vomiting center" in the brain. The advantage of phenobarbital over atropine is the absence of alarming febrile reactions as is so often observed with the use of atropine alone.

It has been emphasized that all the barbital derivatives exert their effects most markedly when the patient is kept in quiet surroundings away from nervous excitement.

Phenobarbital is available in one quarter grain tablets. We have found that a tablet of this size, crushed, and given before or in each feeding, is the largest dose necessary to control the most obstinate or severe curable case of colic or vomiting. The average case requires only one-eighth of a grain dose. We have made a practice of combining one drop of a fresh 1:1000 solution of atropine sulphate with each dose of the phenobarbital. We have not observed cases of "atropine fever," when the two drugs have been combined.

R. N. Andrews, M.D.

TREATMENT OF INFANTILE ECZEMA: Harry D. Grossman, M.D., Chicago (Arch. of Ped., August, 1930, Vol. XLVII, No. 8). The treatment of infantile eczema is entirely empirical today, despite the large amount of work which has been done attempting to show that this skin disease is due to the various factors in the diet of infants, such as proteins, fats, carbohydrates, and fruit juices.

Except in very rare instances, removal of butter-fat, excess sugars, orange juice and food proteins produces no relief from either the subjective symptoms or the objective findings, unless local treatment is used at the same time.

Infantile eczema responds, usually, very nicely and fairly quickly, to crude coal tar used in a suitable ointment base, so that it seems rather sorrowful that it is not used more extensively by the medical practitioner generally, and the dermatologist specifically.

In severe cases, characterized by marked redness with much weeping and marked crusting accompanied by severe itching, the author usually starts with the following ointment applied twice daily, morning and night:

Crude coal tar	6.0
Zinc Oxide	....
Powdered starch	4.0
Petrolatum q. s. ad.	30.0

The ointment is removed in the morning with sweet oil or olive oil, and then new ointment is re-applied.

The stage in which the weeping and crusting are absent, and in which the skin is red and rough, may be characterized as of moderate severity, and for this the author reduces the strength of the ointment to ten per cent crude coal tar, using the same base.

The redness and roughness of the skin disappear more slowly than do the weeping and crusting, but usually in 7 to 14 days on this second salve the skin is smooth and may be almost normal in color or a bit pinker than normal. As the skin improves, the strength of the ointment should be again reduced, this time to five per cent, and applied twice daily for seven to ten days even though the skin looks normal.

Any tendency to recurrence of the eczema is countered by an application of the five per cent ointment.

R. N. Andrews, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

TEXT-BOOK OF HISTOLOGY. Harvey Ernest Jordan, A.M., Ph.D. Professor of Histology and Embryology, University of Virginia. 857 pages. Illus. New York: D. Appleton & Company, 1930.

NERVOUS INDIGESTION. Walter C. Alvarez, M.D., Associate Professor of Medicine, University of Minnesota (The Mayo Foundation). 297 pages. Price, $3.75. New York: Paul B. Hoeber, Inc., 1930.

DIETETICS AND NUTRITION. Maude A. Perry, B.S., formerly Director of Dietetics at the Michael Reese Hospital, Chicago, and at Montreal General Hospital. 332 pages. Price, $2.50. St. Louis: C. V. Mosby Company, 1930.

GONOCOCCAL INFECTION IN THE MALE. Abr. L. Wolbarst, M.D., Urologist and Director of Urologic Clinic, Beth Israel Hospital; Consulting Urologist, Central Islip State Hospital, Manhattan State Hospital, etc. 297 pages. Illus. Price, $5.50. St. Louis: C. V. Mosby Company, 1930.

PERSONAL AND COMMUNITY HEALTH. Clair Elsmere Turner, M.A., Dr.P.H. Professor of Biology and Public Health, Massachusetts Institute of Technology, etc. 443 pages. Illus. Price, $2.75. St. Louis: C. V. Mosby Company, 1930.

PRINCIPLES AND PRACTICE OF MEDICINE. Sir William Osler, Bart., M.D., F.R.S. Eleventh Edition Revised by Thomas McCrae, M.D. 1237 pages. Illus. New York: D. Applcton & Company, 1930.

LABORATORY PEDIATRICS (Vol. XX, Clinical Pediatrics). John D. Lyttle, A.B., M.D., Assistant Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Columbia University, etc. 189 pages. Illus. New York: D. Appleton & Company, 1930.

COMPOSITE INDEX AND CUMULATIVE SUPPLEMENT (Vol. XXI, Clinical Pediatrics). 385 pages. New York: D. Appleton & Company, 1930.

DISEASES OF THE GENITO-URINARY SYSTEM IN INFANCY AND CHILDHOOD. Henry F. Helmholz, M.D., Professor of Pediatrics, University of Minnesota (The Mayo Foundation), etc.; and Samuel Amberg, M.D., Associate Professor of Pediatrics, University of Minnesota (Thc Mayo Foundation), etc. 239 pages. Illus. New York: D. Appleton & Company, 1930.

WANTED—Position as physician's office assistant or clinic assistant, by registered nurse with several years' experience. Address D-103, care MINNESOTA MEDICINE.

POSITION WANTED—As assistant to hospital superintendent. Experienced. Can furnish excellent references. Address D-104, care MINNESOTA MEDICINE.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline, Saint Paul. Rent $25.00 a month. Inquire at dentist's office.

FOR SALE—Practice in southwestern Minnesota. Good town in best farming part of state, nearest doctor nine miles. Best reasons for selling and all asked is to take the home. Address D-100, care MINNESOTA MEDICINE.

WANTED—First class eye, ear, nose and throat specialist to become associated with a group of physicians in Minneapolis. Overhead expenses on percentage basis. State age and place of special training. Address D-99, care MINNESOTA MEDICINE.

FOR SALE—Wonderful opportunity for surgeon. Eighteen room hospital. Operating room. Modern. Good practice, rich country. Building cost $21,000. priced $6,000. Small cash payment. Will send photo. Address Wallace King, Waverly, Minnesota.

POSITION WANTED—Technician with three years' experience in hospital and clinical laboratories desires location. Address D-98, c/o MINNESOTA MEDICINE.

FOR SALE—Complete office, reception and examining room equipment. Office for rent, Lowry Medical Arts Building, $30 per month. Call Dale 7748.

WANTED—Position as assistant, partner or location for general practice. Minnesota graduate; one year interneship General Hospital, Minneapolis; two years assistantship in general practice; one year's surgical residency. Good references. Address D-101, care MINNESOTA MEDICINE.

LOCUM TENENS DESIRED by well qualified physician. Licensed in Minnesota. Available at once. Address D-102, care MINNESOTA MEDICINE.

MINNESOTA STATE MEDICAL ASSOCIATION

SIXTY-SECOND ANNUAL SESSION

DULUTH, MINNESOTA

PROCEEDINGS OF THE HOUSE OF DELEGATES

FIRST MEETING, MONDAY AFTERNOON, JULY 14, 1930

The meeting of the House of Delegates of the Minnesota State Medical Association, held in the English Room of the Hotel Duluth, Duluth, Minnesota, convened at 2:10 o'clock, Dr. S. H. Boyer, President of the Association, presiding.

PRESIDENT BOYER: The meeting of the House of Delegates will come to order.

The Chair has appointed a Credentials Committee consisting of: Dr. E. S. Boleyn of Stillwater, Dr. S. H. Baxter of Minneapolis, Dr. A. W. Adson of Rochester, and we are ready to listen to its report. Is the committee ready to report?

DR. BOLEYN (Stillwater): There are fifty-one accredited members present.

The following delegates were present:

Blue Earth County—J. T. Schlesselman, Mankato; Blue Earth Valley—Not represented; Camp Release District—M. S. Nelson, Granite Falls; Central Minnesota—H. C. Cooney, Princeton; Chisago-Pine County—F. F. Callahan, Pokegama; Clay-Becker—R. E. Scott, Detroit Lakes; Dodge County Medical Society—D. E. Affeldt, Kasson; Freeborn County—W. L. Palmer, Albert Lea; Goodhue County—Not represented; Hennepin County—W. A. Fansler, E. K. Green, W. A. Jones, J. A. Myers, C. B. Wright, S. H. Baxter, N. O. Pearce, F. A. Erb, Ivar Sivertsen, H. B. Hannah, Donald McCarthy; Houston-Fillmore County—Not represented; Kandiyohi-Swift—C. L. Scofield, Benson; Lyon-Lincoln—Not represented; McLeod County—Not represented; Meeker County—A. W. Robertson, Litchfield; Mower County—C. L. Sheedy, Austin; Nicollet-Le Sueur—Not represented; Olmsted County—Waltman Waters, F. A. Willius, A. W. Adson, W. F. Braasch, L. W. Pollock, P. A. O'Leary, H. M. Conner; Park Region District—A. D. Haskell, Alexandria; Ramsey County—E. M. Hammes, H. J. Rothschild, O. W. Holcomb, Carl B. Drake, V. P. Hauser, F. H. Neher; Redwood-Brown—George B. Weiser, New Ulm; Red River Valley—H. M. Blegen, Warren; O. E. Locken, Crookston; Rice County—A. M. Hanson, Faribault; St. Louis County—B. S. Adams, Hibbing; J. R. Manley, Duluth, F. H. Magney, Duluth, C. L. Haney, Duluth; Scott-Carver—W. F. Maertz, New Prague; Southwestern Minnesota—Wm. A. Piper, Mountain Lake, F. M. Manson, Worthington; Stearns-Benton—C. B. Lewis, St. Cloud; Steele County—A. B. Stewart, Owatonna; Upper Mississippi—J. A. Thabes, Brainerd, F. F. Kumm, Wadena; Wabasha County—W. H. Replogle, Wabasha; Waseca County—B. I. Saliterman, Janesville; Washington County—E. S. Boleyn, Stillwater; Watonwan County—B. H. Haynes, Butterfield; West Central Minnesota—Not represented; Winona County—C. P. Robbins, Winona; Wright County—A. M. Ridgway, Annandale.

PRESIDENT BOYER: We are now ready to consider the minutes of the last meeting. The minutes are rather long and have been published in MINNESOTA MEDICINE, so the reading of them may be dispensed with unless you desire otherwise. What shall we do with the minutes of the last meeting?

A motion was made and seconded that the reading of the minutes of the last meeting be dispensed with and the minutes accepted, which motion, being put to a vote, was carried.

PRESIDENT BOYER: The first report this afternoon is that of the President of the Council, Dr. H. M. Workman, of Tracy.

Dr. Workman read the report of the President of the Council.

MEETING OF THE COUNCIL

A meeting of the Council of the Minnesota State Medical Association was held on Sunday, July 13th, 1930, at 6:30 P. M. at the Hotel Duluth, Duluth, Minnesota, Dr. Workman, President of the Council, presiding.

The following were present: H. M. Workman, W. H. Condit, W. A. Coventry, M. S. Henderson, F. A. Dodge, G. S. Wattam, W. W. Will, F. J. Savage, L. Sogge, S. H. Boyer, A. G. Schulze, E. A. Meyerding.

The minutes of the meeting of the Council on January 10 were read and approved.

Dr. Schulze read the Treasurer's report for the year 1929.

Dr. Savage, chairman of the Finance Committee, read the report of the Fiscal Agency Account, with a statement of property. The report was accepted and placed on file.

The second quarterly report from MINNESOTA MEDICINE was read and approved. The profit for MINNESOTA MEDICINE for 1929 was $1,081.52.

Dr. Pearce, Chairman of the Committee on Hospitals and Medical Education, appeared before the Council telling of the plans of his committee for the remainder of the year. Motion made by Dr. Coventry, seconded, and carried that the budget of the Committee on Hospitals and Medical Education be increased $100 for 1930.

A report of the membership of the Association was read. There are at the present time 2,035 paid members.

Motion made by Dr. Savage, seconded, and carried that Dr. Thomas G. Lee of Minneapolis be recom-

mended to the House of Delegates for Associate Membership in the Minnesota State Medical Association.

Motion made by Dr. Schulze, seconded, and carried that Dr. Donald Smelzer, formerly of St. Paul, and now residing in Pennsylvania, be recommended to the House of Delegates for Associate Membership in the Minnesota State Medical Association.

Motion made by Dr. Savage, seconded, and carried that Dr. John F. Noble be recommended to the House of Delegates for Associate Membership in the Minnesota State Medical Association.

A list of the Affiliate Fellows elected at the Detroit Session of the American Medical Association was read.

Motion made by Dr. Sogge, seconded, and carried that the Council recommend to the House of Delegates the granting of a charter to form the Dakota County Medical Society as requested in the petition presented.

Motion made by Dr. Boyer, seconded, and carried that a letter be written to the secretary of the Minnesota Funeral Directors Association calling his attention to the law that makes it compulsory for the physician to sign a death certificate and suggesting that he call this to the attention of the physician when asking him to sign such a certificate.

The reports of the Councilors were received and placed on file.

Dr. Boyer's letter to Mrs. Mendenhall, president of the Parents-Teachers Association, was read. The Attorney General's opinion *re* pre-school examination was read. It was suggested that these letters and Mrs. Mendenhall's reply to Dr. Boyer be read before the House of Delegates.

The Minnesota State Medical Association did not have a representative at the U. S. Pharmacopeia Meeting as Dr. Hirschfelder could represent only one organization, the University.

Motion made by Dr. Henderson, seconded, and carried that Drs. H. M. Johnson and W. F. Braasch be recommended to the House of Delegates for re-election as delegates to the American Medical Association for a period of two years beginning January 1, 1931.

Motion made by Dr. Coventry, seconded, and carried that Drs. B. S. Adams and O. J. Hagen be recommended to the House of Delegates for re-election as alternate delegates to the American Medical Association for a period of two years beginning January 1, 1931.

The reports to be presented to the House of Delegates were discussed:

Dr. Coventry was appointed a committee of one to draw up an amendment to the By-Laws to be presented to the House of Delegates abolishing the Committee on Necrology. The Necrologist's report will become one of the duties of the Historical Committee.

Motion made by Dr. Boyer, seconded, and carried that the name of Robert Emmett Farr be commended to the Nobel Prize Committee for consideration in reference to his original work in local anesthesia, in particular that of splanchnic nerve anesthesia.

Motion made by Dr. Condit, seconded, and carried that the Secretary's salary be increased $100 a month.

The meeting adjourned at 12:35 A. M.

President Boyer: Gentlemen, what will we do with the report of the President of the Council?

A motion was made and seconded that the report be accepted, which motion was carried.

Dr. Myers (Minneapolis): I move that the House of Delegates extend to the Council, and to Dr. Workman especially, a vote of thanks.

This was done.

President Boyer: Gentlemen, whether you like it or not, this profession is no longer an austere and closed cloister body. We have no business to think of ourselves as being set apart with a special knowledge which entitles us to special consideration. You have to take part in the things that are going on. You must enter into the mode of the world today, and you must expect that there will be continued expense in the maintenance of your organization and the carrying on of the work involved, and you must expect that from time to time there will be increases in the expenses, and you must expect that from time to time the expenses will grow less, dependent upon the conditions that exist.

I wish to introduce a guest that we have with us today, the Secretary of the American Medical Association. I take pleasure in introducing to you Dr. Olin West. (Applause.)

Dr. West (Chicago): Mr. Chairman, and gentlemen of the House of Delegates: I sincerely appreciate this courtesy extended to me. I have no desire whatever to impose upon your time. I know you have many things to deal with, and I don't want to interfere with your program. I listened with real delight to the report of the Council submitted by its honored Chairman. I recall very distinctly my attendance at a meeting of the Minnesota Medical Association some six or eight years ago, and it is perfectly evident to me, who am interested, of course, in the activities of all state medical associations that are constituent units of the American Medical Association, that the Minnesota State Medical Association has made notable progress, and I am convinced from the comments I have heard expressed here upon the interest your representatives take in the House of Delegates of the American Medical Association, from the improvement that has been made in its official organ and from the positions that are being taken by members of this Association, that the Minnesota State Medical Association has set its eye to the pinnacle and it is going to continue to progress. I am very grateful indeed to you, Mr. Chairman, for your courtesy, and am glad to have the opportunity of being here today. (Applause.)

President Boyer: We have the honor, gentlemen, of having as a guest today, Mr. W. J. Burns, the Executive Secretary of the Wayne County, Michigan, Society. Wayne County is that district in which the small town of Detroit has its being. I would like to call upon Mr. Burns for a few remarks. (Applause.)

Mr. Burns (Detroit): I think my remarks can be epitomized in this little note I received before I left Detroit from Dr. Warnshuis. He says:

"Dear Red: When you go to Duluth you are commissioned by me to extend to the Minnesota doctors

Michigan's fraternal greetings and good wishes. We join with them in a concerted, sustained activity to convey the truths and principles of modern scientific medicine to the people in order to enhance their health welfare. We seek to provide our members with opportunities for post-graduate work in order that their service may reflect the knowledge of today. We strive to defeat the machinations of the quack and of those who along political lines seek to lower the qualifications for practice. In these activities we note with favor the achievements of the Minnesota profession and bid them to continue their militant attitude. Such achievements are an inspiration to all who are concerned with an attainment of the ideals of medicine.

Sincerely,

F. C. WARNSHUIS."

That is all I have to say, except that I want to thank you for the opportunity of making these few remarks, and I want to ask you to come back to Detroit for another American Medical Association meeting if Dr. West decides it will be there very soon. (Applause.)

PRESIDENT BOYER: I am sure we all appreciate the remarks of Mr. Burns.

Next is the report of the President of the Association.

PRESIDENT'S REPORT TO THE HOUSE OF DELEGATES

Gentlemen:

The work done so far this year has been largely in the field of medical organization, with occasional visits to other medical organizations in a representative capacity.

There were five meetings of the program committee, all of which were attended by the president. At the meeting in February of the American College of Physicians an address of welcome was extended in the interest of the State Association. About the same time a meeting was called of the chairmen and members of the various committees with the idea of correlating various committee work and establishing an interest on the part of the various committee members in the work assigned to them. The day following this meeting there was a special meeting of the legislative committee.

On the 5th of April there was a conference with the executive committee of the Hennepin County Medical Society to consider financial matters. In April the meeting of the Ramsey County Medical Society was attended also. The special purpose in this case was a discussion of State Society dues. It may be well to state at this point that almost uniformly through the state the present dues meet with approval on the part of the component societies and members.

The spring meeting of the Upper Mississippi Valley Medical Association was attended at the request of its membership. The society desired information concerning various state activities. Organization meetings were attended at Willmar, Brainerd, Winona, Austin and Albert Lea.

An address was given to the Iowa State Society meeting at Marshalltown in May, in relation to medical legislation as it obtains in Minnesota.

Aside from attending the reception tendered by the Mayo Clinic to Dr. E. Starr Judd, president-elect of the American Medical Association, the work has been of a routine nature.

PRESIDENT BOYER: The report of the Secretary is in the hands of the Reference Committee. We will hear that report later. We will proceed now with the report of the delegates to the American Medical Association.

DR. BRAASCH (Rochester): As I recall it, the delegates sort of divided the burden among themselves. I am supposed to give a résumé of the meeting of 1929 which was held in Portland. I will not detain you long with the report, as it is already a matter of past history.

DELEGATE'S REPORT OF PROCEEDINGS OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION DURING THE MEETING OF 1929

It is unfortunate that the best way we have at our command of informing the members of the Association as to the activities of the various officers and committees of the American Medical Association and as to the proceedings in the House of Delegates is through the annual report of the State delegate to the local House. It is true that these proceedings and committee reports are published in the Journal of the American Medical Association, but they are usually published in one or two issues, in fine print and placed in the back of the Journal, so that very few of the members take the time and trouble to read the rather voluminous reports. It would be much better if a synopsis of the more important activities were made, so written that it would appeal to the average member of our Association, and printed in a separate form such as in the Monthly Bulletin, which would insure a widespread circulation. It would obviously be for the best interests of our Association to create an intelligent opinion among its members. In this way only is it possible for the House of Delegates and the officers to obtain the best results in the conduct of its affairs.

As I said before, the inadequacy of a report of this kind is apparent. However, I will content myself with a brief summary of the more important activities, some of which I hope will make some appeal to you.

The meeting of last year, which was held in Portland, had an unusually small registration, the total being but 3,061, the largest number being from the western coast and the middle west. There were but 200 men registering from the east, showing how provincial the easterner really is and furthermore, how much farther it is from the Atlantic to the Pacific coast than it is from the Pacific to the Atlantic coast.

In his address President Thayer discussed a variety of subjects, including the work of the Council on Medical Education and Hospitals, and referred to the desirability of carrying on the work of the Index Catalog in the Surgeon General's Office. He also referred to the legislation which interfered with the preroga-

tives of the physician in regard to prescription writing and as a result aroused a controversy in the press between the clergy and himself. President Thayer, however, was supported in his stand, which was quite logical, by the House.

President-elect Harris in his address referred to the high cost of medical care and urged that the subject should receive the serious consideration of the medical profession; that the solution was in their hands rather than in the hands of the layman.

A resolution to the effect that expenses of the delegates be paid by the American Medical Association failed to pass.

Attention was called to the fact that there were a number of hospitals that were unethical in their methods of advertising and that some 400 hospitals have already been omitted from the list of accredited hospitals on account of such unethical practices.

Plans for increasing the size of the headquarters and enlarging the opportunities of the Association received favorable action.

It was proposed that all papers read before the Scientific Session of the Association be published, but the resolution was defeated.

A resolution favoring the establishment of a Home for Aged Physicians was defeated, because it was thought that it was more a matter for individual state societies to decide rather than the national organization.

The value of diagnostic clinics and clinical lectures in the program was emphasized.

The clause in the constitution referring to the Principles of Medical Ethics in Section 3, Art. VI, Chapter II, was altered so as to read as follows: "When a patient is referred by one physician to another for consultation or for treatment, whether the physician in charge accompanies the patient or not, it is unethical to give or to receive a commission by whatever term it may be called or under any guise or pretext whatsoever."

Doubtless you will recall that in the 1928 meeting you charged your delegates to call attention and to criticize the action of the Red Cross in authorizing its nurses to nurse for those other than regular practitioners. This was done and a vote of approval given.

The raising of the price of the Journal of the American Medical Association from $6 to $8 was authorized.

Four cities extended invitations to the American Medical Association as the next meeting place, namely Detroit, Philadelphia, Atlantic City and Memphis, Detroit being selected.

In order to obtain an adequate idea of the scope of the work which is being done by the various officers and committees of the Association it would be necessary to read detailed reports. Most important among them was that of the Board of Trustees. The scope of the work of this most important body is exceedingly wide and a perusal of the report would well repay one for the trouble.

In their report the Board of Trustees urged that the circulation of Hygeia be increased, and called attention to the fact that it is particularly applicable to the office table of most physicians. They called attention to the good work of the Women's Auxiliary in extending the circulation of Hygeia. They also mentioned the increase in the use of the Association library in the lending of periodicals.

Attention was called to the work of the Council on Pharmacy and Chemistry and it was stated that as a result of the untiring and unselfish service of those who compose the Council, the leading representatives of the American Pharmaceutical industry have relegated the drug mixture to the background, and by the employment of competent scientific staffs are doing an excellent work in the development of new and better drugs. From year to year appreciation of the Council's work has been increasing and today this body is recognized as an authority on drugs and drug therapy alike by the medical profession and by the pharmaceutical industry. It would seem that the reports of the Council on Pharmacy and Chemistry should have a wider circulation than at present. Few of us realize how many activities this Council is engaged in. Among the most interesting is the Therapeutic Research Committee, which has charge of subsidizing research problems in various lines of therapy. It is also true that intelligent investigation is carried on in the Chemical Laboratory. The work of the Council on Physical Therapy was also commented upon and commended.

No doubt few of us also realize the scope of the work of the Bureau of Investigation which answers thousands of letters of inquiry of various kinds during the year.

Probably the most interesting report from the Bureau of Legal Medicine and Legislation was that regarding the progress made in the matter of income taxes on the earnings of physicians. The attitude of the House of Delegates toward the Sheppard-Towner Maternity Act was reasserted as being inimical to its continuation. On the subject of Medical Defense it was stated that what was needed was organized effort by medical defense committees maintained by our state medical associations to prevent claims based on alleged malpractice from arising. This function of the medical defense committee seems to be more important than its function of assisting in the settlement of claims after they have arisen.

All of these committee reports and the various resolutions offered were referred to reference committees of the House of Delegates for their consideration and criticism. Voicing their approval or suggesting alteration, these reports were referred to the House for further consideration and approval. Every opportunity is given the members for expression of individual opinion. It is remarkable how the majority opinion is frequently registered with no uncertainty and usually with logical intelligence. The smoothness with which the large amount of business is taken care of is largely due to the good judgment and keen intelligence of the Speaker of the House, Doctor Warnshuis.

PRESIDENT BOYER: We would like to hear from Dr. Wright, another of the delegates.

DR. WRIGHT (Minneapolis): I don't like to take up

too much time. The thing, I think, that impresses you in the House of Delegates is the efficiency and speed with which things are transacted. The reports, as a rule, are very brief and very thorough and comprehensive. During the interim they thresh out these reports and anyone who wants to defend his report can do it there. But it is a very impressive legislative body, and it seems to me that there was more zip and energy and keenness exhibited in the House of Delegates in discussing our many problems than there ever was before.

One of the outstanding things we had to deal with was the question of the new legislation regarding veterans of the World War. Mr. Hoover wired for our opinion on the question, and he got it in a very convincing way. It shows how our Association has risen in the minds of those in the legislative halls when they will wire for our opinion. There is no question but what the Chicago office is on its toes. The outstanding thing, I think, this year was the new Economics Bureau. It was introduced by California organizing an Economics Committee to take up all these questions relating to the economy question of the profession and try to devise some, solution, or at least to have some point of view in our attitude with the public on many of these questions. That was thoroughly discussed.

The question of the veterans' legislation, apparently no solution was offered and no method of solution could solve it. This question of constant expense and care of soldiers who have become ill since the war is a very serious matter. I was talking to some of the Congressmen at Washington and they said it is going to cost this country a hundred billion dollars to take care of them. One question which Congressman Andresen was very anxious for me to answer was this: Is it true that these men can not be taken care of as well by civil doctors in civil hospitals as they can in Government Hospitals and by Government doctors? He said, "Of course, I feel just as you do about it, that it is perfectly ridiculous to think that the Government can take care of these men better than they can be taken care of by you doctors in civil practice." This legislation will lead to the building of numerous hospitals, and they will have to do something later with the hospitals when the need for them has passed. Even if there are no veterans they can put someone else in them.

We suggested a committee to work with the Legal Defense Committee to try to coöperate and get their support in Washington by contact with local Congressmen and Senators. It is a well known fact that the local Congressmen will listen more to the local group if they are well organized than they will to any other group.

Of course, the outstanding thing that was done was the election of Dr. E. Starr Judd. He is a Minnesota man and was elected by his friends. A number of surgeons from all over the country came and used all kinds of pressure for Dr. Judd, and I think it was a very wonderful thing. I hoped Dr. Judd would be here this afternoon so that we might see him and have him presented to this body.

The meeting, of course, will be in Philadelphia next year. I think that is one of the things that is difficult for the men in the House of Delegates to determine. The different places go in and ask for meetings and we don't know just what the facilities are, because the men who know are not permitted to come in and state frankly just which place is the best. It would be a fine thing for Mr. Braun if someone could come in and say we know just which town is best equipped to take care of us in the best way. But of course we are not permitted to do that.

I think we would all welcome any questions about the meeting. I would like to second Dr. Braasch's advice that everyone read carefully the published transactions, and I think we ought to hear from Dr. Herman Johnson inasmuch as he has some subterranean method of acquiring information which the others of us do not possess, and I think he could probably give us some additional information. (Applause.)

PRESIDENT BOYER: I don't suppose anyone here ever heard of Dr. H. M. Johnson, commonly called Herman, but Herman, will you come here and give us a few words?

DR. JOHNSON (Dawson): I was one of the delegates to the American Medical Association at Detroit this year. It is a wonderful organization and is becoming more of a real organization all the time. You would hardly recognize the American Medical Association House of Delegates of 1930 as the same organization which met in Dallas when I first was a delegate. They worked hard then, but they work harder now. They do their best for the rank and file of the medical profession. And I want to tell you that some of the members of the House of Delegates are not afraid either. If they think they are right, they will fight for their beliefs. We have found that we have to do the same thing and we get along all right. The American Medical Association is certainly fortunate to have such men at the head of it as it has. I want to say that I don't believe anyone could fill the position of secretary as Dr. West has. We hope Dr. West will be well and strong and able to continue the work he has done so well in the past. In electing Dr. Judd as president, it was a case of the office seeking the man and not the man seeking the office. That is the only way anyone should be elected president.

One of our main troubles is social and state medicine. It is absolutely necessary that we stand by the American Medical Association in every way, because it is only by united action with them and through them that we can fight off state and social medicine. Delegates from the East said they were fighting with their backs to the wall and that if we didn't take the very best steps and go right after it, we would soon be in the same position as the medical profession is in Europe. We might not be able to stop it, but we can modify and direct it to a great degree. Let us continue our efforts along those lines. (Applause.)

PRESIDENT BOYER: You have heard the report of

the Delegates to the American Medical Association. What will you do with the report?

Dr. Savage (St. Paul): I move it be accepted, with an expression of appreciation for what they have done.

(This motion was carried.)

President Boyer: In the spring the conference on Hospitals, Medical Education and Licensure was held in Chicago. It is an annual affair. Dr. Braasch was present at this conference. We would like to have a report from Dr. Braasch covering this conference.

Dr. Braasch (Rochester): I happened to be at a medical meeting in the East and stopped at this meeting on the way back.

REPORT OF ANNUAL CONGRESS OF MEDICAL EDUCATION, LICENSURE AND HOSPITALS

The annual congress of Medical Education, Licensure and Hospitals held in Chicago this year attracted several hundred men from far and wide who are interested in the problems involved. Many of the subjects discussed have reappeared perennially and their solution seems no nearer. In the course of time, however, and as a result of such discussions, many controversial points are cleared, giving room for progress. It is not alone the stimulation of ideas and the comparison of experiences which are of value in conferences of this kind. Probably of greater value are what may be called the by-products, namely the contact of individuals with common purposes and ideals, permitting discussion of major problems as well as allied subjects, devoid of the formality and embellishments of set papers. The value of these informal conversations is frequently worth expense and effort involved.

Aside from the three divisions stated on the program there were gatherings of representatives of many other interests and there were meetings other than those included in the program. Predominant in the attendance at many of the gatherings was a liberal representation of the nursing organization.

Probably the gathering which attracted the most attention was the Conference on Hospital Service and the Cost of Medical Care, on Tuesday, Dr. Harry E. Mott presiding. There were a number of excellent papers in this symposium, which aroused considerable interest in the subjects involved. Dr. Caldwell's contribution was more or less a defense of the present methods of conducting hospitals and of the expense involved, inferring that everything possible was being done under the circumstances to reduce the minimum. It was also his impression that the peak of hospital cost had been reached and would probably recede from now on. He made one claim which is worthy of consideration, namely that the cost of hospitalization to the indigent should not be borne entirely by the hospital, but should be shared in part by the community through taxation. He also called attention to the great value of the hospital as an educational factor, not alone to the medical profession, but to the public as well, and stated that the expense of this activity should not be borne by the hospitals alone.

This was followed by a paper by Dr. James B. Herrick, who discussed hospitals from the viewpoint of the medical staff and pointed out many ways in which the expense could be materially reduced. He suggested that members of the staff be continually on the lookout for means whereby economy could be practiced and that they consult freely with the hospital management in this regard. He felt that much saving could be brought about in the way of nursing; first in regard to group nursing, which he believed gave much economic promise for the benefit of the average patient. He thought that nursing service by the hour might also be applicable in many cases where it is not necessary to have constant attendance. He also stated that in many cases patients are unnecessarily placed in private rooms and would be just as well off, if not better, in wards. While he did not decry the college degree for a nurse, he did not think this was always necessary, but that this type of nurse should be given special duties and responsibilities.

Dr. Herrick felt that hospitalization was unnecessary for examination of patients in most instances. This practice is followed quite freely, largely because it is a matter of convenience to the physician, and also because the expense of this examination, in the minds of many patients, reflects the excellence and thoroughness of the examination. He thought that a flat laboratory charge was frequently unnecessary, and that the laboratory charge should be graded according to the patient's means. He felt that many mistakes were made in hospital construction, which were anything but economic; that with the proper planning and care the cost of construction could be materially reduced.

It was also felt that there should be various types of hospitals, according to the patient's pocket-book, much the same as our hotels. In other words, the hospital should be constructed for convenience, comfort and luxury to fit the patient's pocket-book. A hospital might well be equipped to take care of the ordinary wants of a patient and yet be constructed much more cheaply than one where every luxury was present, as in some of the modern hospitals. In this way the patient's means could be better accommodated. Dr. Herrick also made the remark that he thought the modern hospital today was too standardized and had too many rules. He feels that they should be more elastic and more human in their attitude toward patients.

Dr. Arthur T. Holbrook continued the discussion in a most excellent paper entitled "From the Point of View of the General Practitioner." Dr. Holbrook stated that he was proud to be known as a general practitioner and believed that the pendulum was rapidly swinging back and that the fundamental value of the general practitioner in society was being recognized. He stated that the position and the value of the specialist was over-emphasized; that in the hands of a progressive, up-to-date general practitioner only 10 per cent of patients needed hospital care and that a diagnosis could be made in at least 80 per cent of his patients without any consultation with a specialist. He stated that the art of medical practice was illogically subordinated to the science of medicine; that many patients were unquestionably being hospitalized unnec-

essarily, largely for the convenience of the examining physician, which means unnecessary expense to the patient. By a general practitioner he meant one who has kept abreast with knowledge, investigation and treatment, who after a careful general examination acts as a medical advisor and not necessarily a vendor of drugs. It was his opinion that the average group clinic did not solve the problem of the cost of medical care, but that there was a tendency to do unnecessary examinations in such a group.

Dr. Reynolds, in a paper entitled "From the Standpoint of the Layman," called attention to the uneven distribution of hospitals, saying that the laity should be educated as to the actual cost of care and that if they were there would be less criticism. He believes that the science of healing is making great strides, but that the business of healing lags behind. He thought that the budgeting of medical costs by the layman and paying for the same on the installment plan, as for furniture, might be of value. He stated that the problem centered itself around the cost of care for the middle class patient and that it is the other expenses and extravagances that are a large factor.

Dr. Billings in discussion suggested that hospitals for convalescents might be constructed at a considerable reduction in cost. Instead of paying $5,000 for a bed, such hospitals might be constructed at a cost of $1,000 for a bed, and the rates might be as low as $2 per day. Such hospitals as that could take care of ten or fifteen per cent of the patients in hospitals today. It is Dr. Billings' opinion that physical examinations forty years ago were more accurate than they are today and he states that too much depends upon fine laboratory methods for diagnosis, ignoring ordinary methods which would be sufficient in the large majority of cases.

Mr. Gregory, Manager of the Palmer House, was called upon to make some practical remarks from the viewpoint of the hotel man. It was his opinion that feeding patients in the hospital was not a medical man's business, but that of a hotel man or administrator. He thought that the mental attitude of the patient would be greatly improved if the rooms had more of the atmosphere of the hotel than the hospital, and that an effort could be made to make the patient more comfortable and in a happier frame of mind without increasing the cost.

On Tuesday afternoon I attended the meeting of the Federation of State Medical Boards and Medical Licensure, together with Dr. Sanderson, Secretary of the Medical Examining Board of our own State, and Mr. Brist. We went there with the expectation of listening to a criticism of the Basic Science law and the Basic Science boards, and came prepared to defend them if necessary. However, in none of the papers were there any direct accusations made against the Basic Science examinations, although in several of the papers there was veiled criticism and insinuation. It was quite evident that the "Ancient Order of State Examiners" were not in sympathy with the new order of things. The most that was said in opposition, however, was that the Basic Science Board and the Medical Examining Board had not reciprocated in the various states as they should. Dr. W. L. Bierring called attention to this fact and I think his point was well taken. However, in the discussion of the various papers, several of the Medical Examiners gave vent to criticism and vituperation of the Basic Science Act and questioned its efficacy. Although Mr. Brist arose to defend the Basic Science Act in Minnesota, his remarks were not taken with particularly good grace, and he was not given much of an opportunity to display his wares. In the executive session which followed the open meeting, however, no resolutions were passed which were inimical to the Basic Science Boards.

One left with the impression that the average medical examiner was not in sympathy with the Basic Science methods of controlling irregular practitioners, apparently feeling that his prerogatives were invaded.

There is no doubt about the efficacy of the Basic Science Board in the minds of medical men in states where it has been tried out, and it would be safe to assume that in the course of time its value will be recognized by all.

I also attended the Symposia on the full time system of teaching and on the importance of pathology in medicine. Excerpts of the proceedings of these sections have been published in the Journal of the American Medical Association, and I will refer anyone who may be interested to these.

Suffice it to say that a congress of this kind, embracing the various topics involving the progress of modern medicine, is most interesting and stimulating, and if anyone can spare the time to attend these mid-winter conferences, he will be well repaid for his effort.

WILLIAM F. BRAASCH, M.D.

A motion was made, seconded and carried that the report of Dr. Braasch be accepted.

PRESIDENT BOYER: We are now ready for the report of the Reference Committee. Allow me to state that a different procedure has been adopted than has obtained heretofore. The Reference Committee has been requested to submit a summary of each report with recommendations. Following the report and recommendations by the Reference Committee upon each one of the committees whose work it surveys the discussion will be opened by the chairman of the committee whose work is reported upon. The purpose of this is to facilitate the work of the House of Delegates. Everybody has had a copy of all these committee reports. It is requested that the discussions be to the point and be brief. Dr. Manley, of the Reference Committee, will now be heard from.

DR. MANLEY (Duluth): You have all had a chance to read the Secretary's report. The Reference Committee recommends the careful reading of every word of the report of the Secretary. It gives a comprehensive, bird's-eye view of the activities of the Society during the past year. We also recommend the careful perusal of the addenda to the Secretary's report in the form of a letter from Councilor Savage.

REPORT OF THE SECRETARY

The activities of the secretary's office are widely varied and are increasing as our organization develops. At the present time eight committees not listed in the Constitution are operating. These special committees demand information, notices of meetings, and reports for compilation, all supplied by this office.

An increasing number of requests for information and service in the field of economics and private practice are constantly received.

The secretary's office has assisted several component medical societies, both individual members and committees, in constructing surveys relative to the programs and medical economic conditions in other state societies. This has entailed considerable correspondence and compilation of returns.

The weekly newspaper service to Minnesota newspapers has been continued and a plan developed for it whereby the stories are written in our own office. Thus we are eliminating the purchasing of this service from the State Medical Society of Wisconsin.

Letters to the Consultation Bureau now average five or six a week. These letters are acknowledged in this office and referred to Dr. O'Brien for reply.

Almost daily we receive letters from the medical profession informing us of violations of the Basic Science and Medical Practice Acts. These communications usually require a reply or further investigation. Then they are sent to the State Board of Medical Examiners and frequently to the American Medical Association. This service has become an important part of the routine work of the secretary.

Bookings for Mr. F. Manley Brist, Investigating Attorney for the Minnesota State Board of Medical Examiners, are made through the secretary's office. Since the last Annual Meeting, Mr. Brist has talked to the following groups:

May 2, 1929—Wright County Medical Society, Maple Lake.

May 6, 1929—Hennepin County Medical Society, Minneapolis.

May 14, 1929—Women's Auxiliary, Annual Meeting, Minneapolis.

May 21, 1929—Steele County Medical Society, Owatonna.

May 21, 1929—Lions Club, Owatonna.

May 22, 1929—Redwood-Brown County Medical Society, New Ulm.

Sept. 10, 1929—Washington County Medical Society, Stillwater.

Sept. 19, 1929—Kiwanis Club, Tracy.

Sept. 19, 1929—Lyon-Lincoln County Medical Society, Tracy.

Oct. 14, 1929—Camp Release District Medical Society and Ladies Auxiliary, Montevideo.

Nov. 5, 1929—Southwestern Minnesota Medical Society, Slayton.

Nov. 25, 1929—Blue Earth County Medical Society, Mankato.

Nov. 26, 1929—Stearns-Benton County Medical Society, St. Cloud.

Jan. 11, 1930—Secretaries' Conference, St. Paul.

Jan. 23, 1930—Joint meeting of the Lions and Kiwanis Clubs, Mankato.

March 25, 1930—Lions Club, Stillwater.

March 26, 1930—Women's Auxiliary, Hennepin County Medical Society, Minneapolis.

April 22, 1930—Colloquium lecture, Winona.

May 1, 1930—Semi-annual meeting of Blue Earth Valley Medical Society, Fairmont.

May 13, 1930—Mower County Medical Society, Austin.

May 14, 1930—Iowa State Medical Society, Marshalltown, Iowa.

May 15, 1930—Freeborn County Medical Society, Albert Lea.

May 23, 1930—Colloquium meeting, Wadena.

June 24, 1930—Kiwanis Club, Willmar.

June 24, 1930—Kandiyohi-Swift County Medical Society, Willmar.

July 10, 1930—Wabasha County Medical Society, Wabasha.

The contact with the Minnesota Public Health Association has continued in the same manner as it has in the past years, the relation being a close and valuable one for the purpose of reaching the laity especially in the organization of groups and schools. We regret to say that there are still three counties who have independent seals and who are not coöperating with us in our program. They are McLeod, Blue Earth, and Martin counties.

The following is from a clipping in the Minneapolis Journal of about June 23, 1930:

> Papers for incorporation of the Citizens State Health Association have been filed with Secretary of State Mike Holm by a number of lay and professional citizens as a group to promote "the health of people by natural or drugless means, to cooperate with similar organizations for investigation or promoting of health projects submitted by health agencies in the interest of public health, and to distribute health information by way of literature, publications, health lectures and clinics." Officers are Gustav H. Nybeck, president; Mrs. A. C. McBeath, first vice president; Winifred M. Brachlow, second vice president; Mildred M. Skiff, secretary and treasurer, and C. W. Whittenberg, Fred J. Grande and W. J. Hyman, board of directors.

It is evident that cultists are preparing for the next session of the Legislature and expect to use this agency as a "camouflage" to put across propaganda, hoping to influence legislation.

"Everybody's Health," the popular monthly magazine published by the Minnesota Public Health Association, is a valuable medium with which to disseminate the truth about health. There is so much health misinformation put out by faddists, quacks, and commercial groups that "Everybody's Health" makes a convenient medium to promulgate the truth. This magazine goes into every school in the State of Minnesota and most of the hospitals and to many thousands of lay subscribers. It should be in the reception room of every physician's office and merits the endorsement of all who are interested in the practice of medicine and the health of our people.

The secretary's office has conducted a large part of

the program of the Committee on Public Health Education, especially correspondence and booking of speakers, as well as the newspaper service.

Dr. George Earl, Chairman of the Public Health Education Committee, agreed to give two weeks of his vacation again this year to assist in a state-wide tour for the purpose of fostering good will and better organization among members of the medical profession and also a better attitude on the part of the general public. In every community visited, a meeting of the medical profession was held, including members from the surrounding country, frequently from several counties. This health tour was conducted with the cooperation of the Minnesota Public Health Associations, school superintendents, and various local Parents-Teachers Associations, in the towns of Alexandria, Bemidji, Crookston, Fergus Falls, Marshall, Montevideo, Moorhead, Wadena, and Worthington.

Wednesday, October 30, represented a typical day's program of the tour. It consisted of the following: tuberculosis short course at the tuberculosis sanatorium; health talks at the two teachers' colleges and the high school; a medical economics meeting; a public meeting; a meeting for social workers; and a big health "jamboree" in the evening. There was a large and enthusiastic attendance at all of these meetings.

The secretary attended two programs in each city, except Brainerd, of the series of Colloquium lectures this spring. These were the programs devoted to the Minnesota State Medical Association and the Minnesota Public Health Association.

The Colloquium short courses were sponsored by the Committee on Hospitals and Medical Education of the state association coöperating with the Extension Division of the University of Minnesota. They provided one program each week for eight weeks, covering tuberculosis, heart, obstetrics, hospital management, immunology, cancer, and cultural subjects at an expense of only $50 to the local society. Five cities, Wadena, Faribault, Willmar, Winona, and Brainerd, booked them. A large attendance and much enthusiasm marked the series in each city. The secretary believes that better feeling and better organization among the medical profession are among the outstanding by-products of these courses. It is hoped that something along the same lines can be given again this fall.

The secretary made several long tours of the state, including the towns of Albert Lea, Austin, Bagley, Brainerd, Caledonia, Crookston, Faribault, Hawley, Jackson, Lake City, Lake Park, Litchfield, Mankato, Moorhead, New Ulm, Owatonna, Red Wing, Rochester, Saint Cloud, Saint Peter, Sleepy Eye, Spring Grove, Tracy, Wabasha, Wadena, Walnut Grove, Waseca, Willmar, Windom and Winona, to stimulate interest in the Health Tour and the Colloquium lectures as well as participating in the tours and lectures themselves. He attended meetings of Stearns-Benton County, Camp Release District, Rice County, Freeborn County, and Mower County Medical Societies, and of the Northern Minnesota Medical Association; addressed a large number of medical and health groups throughout the state, such as the Lions Club of Stillwater, the Federated Clubs of Jackson, the graduation class of Naeve Hospital, Albert Lea, the Regional Nurses Conference at Austin; attended meetings of the American Medical Association, the State Secretaries' Conference of the A. M. A., the American Public Health Association, the State Board of Control Social Conference, committees arranging the Interstate Post Graduate Assembly, and the Iowa State Medical Association; made several trips to Duluth to confer with the President and the local committees in arranging the Annual Meeting; and held innumerable smaller conferences in Saint Paul and Minneapolis on matters that relate to the business of the Minnesota State Medical Association, namely, meeting of the Executive Committee of the Hennepin County Medical Society, meetings of the Committee on Scientific Assembly, regular meetings of the Council.

The secretary wishes to extend his personal appreciation for the splendid coöperation received from those who accompanied him to the various gatherings of the medical profession throughout the state. In particular he wishes to thank Dr. S. H. Boyer, Dr. R. M. Burns, Dr. George Earl, Dr. E. J. Engberg, Dr. J. M. Hayes, Dr. M. S. Henderson, Dr. N. O. Pearce, Dr. F. J. Savage, Dr. Theodore Sweetser, Dr. W. W. Will, Dr. C. B. Wright, Dr. J. A. Myers, Dr. Leo G. Rigler, Dr. Walter H. Ude, Dr. F. F. Callahan.

Dr. F. J. Savage and the secretary attended the medical meeting at Hastings at which a resolution petitioning the House of Delegates for organization of a Dakota County Medical Society was drawn up. With the organization of this society, only one county, Lake of the Woods, in the entire state of Minnesota will remain unorganized or unaffiliated with some county organization.

The ever enlarging attendance at county meetings of the medical profession is doing much toward making a stronger organization for our state, we believe. We are willing to arrange programs and aid in securing speakers for any county medical society. News items and notes of meetings from county societies are welcome. They cement our organization. We want to feel that the county societies are part of us and that this is their office. We hope they will call on us.

Two fruitful state meetings were held in the Twin Cities during the year. One was Dr. Boyer's meeting of committee chairmen, held in Minneapolis in connection with the meeting of the American College of Physicians in that city, an unusual and effective gesture toward coöperation and centralization.

The other was the annual secretaries' conference held in Saint Paul, January 11. Thirty societies throughout the state were represented at this conference. Officers of the state association and many other members were present. The important problem of what to do about inflammable *x*-ray films was discussed by experts from the Eastman Kodak Company, from the fire department, and from the medical profession, and discovered to be no problem. It was clearly indicated that the acetate film, which is no more dangerous to have around than so much paper, can be used just as effectively as the dangerous nitro-cellulose variety now,

and no more expensively either, if you consider the expensive and elaborate filing systems with their fresh air vents and sprinklers that are necessary to proper protection of the nitro-cellulose film.

Outdoor storage vaults were recommended for such of the old inflammable films as it is necessary to keep for teaching, clinical, or legal purposes.

The fundamental and practical character of the American Heart Association's program as indicated by Dr. I. C. Riggin, executive secretary, New York, recommended itself to the conference. Scientific research, evolution of a standard nomenclature to aid in diagnosis, and sundry suggestions as to care and rehabilitation of convalescent cardiacs were embodied in it.

These were two important and interesting items on this program which proved to be one of the most valuable ever held by the association. Reports from local societies and meetings of important committees occupied more than the day allotted to the conference and demonstrated again the value of these secretaries' meetings to the closer organization and more efficient cooperation among the medical profession in this state.

Your secretary was impressed on his attending the American Medical Association meeting at the amount of organization that has taken place in the medical profession in the past few years throughout this country. I had the privilege of being the only state secretary who was invited to attend a meeting, which began at 12 o'clock noon and lasted until midnight, of local full-time secretaries. All these were laymen with the exception of one from Brooklyn. Such cities as Detroit, Brooklyn, Milwaukee, Saint Louis, Cincinnati, Toledo, Chicago, Des Moines, and others were represented. It is gratifying to know that so many large centers have made definite progress in organizing the profession into strong units.

The problems that have confronted these locals in recent years have been met by them in very much the same manner as they have been met here. Strong committes are working in these organizations. Mr. Burns, who will speak at the medical economics meeting, will give an outline of what these locals are doing and what the functions of the lay secretary are.

We are interested to note that the House of Delegates of the American Medical Association passed a resolution introduced by the Minnesota delegation which provided for a committee of five to investigate national legislation and make a report to the House of Delegates and the Board of Trustees.

Another resolution was passed creating a Board of Medical Economics in the American Medical Association. This resolution came from California.

The universal acclamation with which these two resolutions were received indicates that the profession throughout the United States realizes the problems that are before them.

Report from attorneys, Oppenheimer, Dickson, Hodgson, Brown, and Donnelly:

"Anna Anderson vs. Dr. Henry L. Ulrich of Minneapolis. Case pending. Not on the calendar of Hennepin County for trial. Undoubtedly will never be brought to life.

"Dr. F. D. Gray, of Granite Falls, Minnesota, vs. George Griger. No developments.

"Dora Halter vs. Dr. William E. Browning of Caledonia, Minnesota. Case disposed of by the death of Dr. Browning. A dismissal was subsequently filed in Court."

At present, membership by societies of the state association, as compared with December 31, 1929, is as follows:

	Dec. 31, 1929	July 2, 1930	Affiliate	Association	Total
Blue Earth County	31	30	1		31
Blue Earth Valley	22	23	5		28
Camp Release Dist	43	42	1		43
Central Minn. Dist	14	13			13
Chisago-Pine County	14	17			17
Clay-Becker County	17	15	1		16
Dodge County	6	6			6
Freeborn County	17	18			18
Goodhue County	14	14			14
Hennepin County	508	516	22	7	545
Houston-Fillmore	20	21	1		22
Kandiyohi-Swift	22	21			21
Lyon-Lincoln	18	18	1		19
McLeod County	13	12			12
Meeker County	8	8			8
Mower County	23	22	1		23
Nicollet-LeSueur	17	19			19
Olmsted County	314	314		1	315
Park Region Dist	39	36			36
Ramsey County	297	286	14		300
Red River Valley	57	53			53
Redwood-Brown County	31	28	3		31
Rice County	30	31	2		33
St. Louis County	181	171	4		175
Scott-Carver County	24	24	1		25
Southwestern Minnesota	48	52	2		54
Stearns-Benton County	37	42	4		46
Steele County	10	9			9
Upper Mississippi	73	63			63
Wabasha County	11	10	2		12
Waseca County	11	9			9
Washington County	14	13			13
Watonwan County	7	7			7
West Central Minn	23	26			26
Winona County	23	24			24
Wright County	16	14			14
TOTALS	2,053	2,027	65	8	2,100

The growth of your program has been rather rapid and expansive. There is enough experience at hand now to consider the advisability of curtailing the factors of least importance. The administrative expense has been unusually low due to the interest of those participating in the program and increased administrative expenditures will be necessary immediately.

The success of a central office in rendering real and lasting service to the society must depend upon proper guidance from state officers and committees and the

loyal efficient coöperation of the component units with the state organization.

E. A. MEYERDING.

ADDENDA TO THE SECRETARY'S REPORT

The following letter written by Councilor F. J. Savage to the members of the Ramsey County Medical Society contains so much of value that it was thought advisable to include it in the Secretary's Report so that all the members of the Minnesota State Medical Association would be familiar with its contents.

To the Members of the Ramsey County Medical Society:
Dear Doctor:

At the April meeting—the 28th—the question of the dues of the State Medical Association will come up for discussion.

The fundamental question is not so much that we are spending $15.00 per year for support of the State Association but are we getting results from this expenditure sufficient to justify this amount? So many statements are made without foundation that a consideration of the various phases of State Association activities is desirable.

Since the statement has been made that membership in the state and county societies has fallen off since our dues advanced in 1927 to $15.00, let us review the membership from 1926 to date of both the State Association and the County Society:

Year	Total No. of M.D.'s registered in State	State Society including Affiliate members	Ramsey County including Affiliate
1926		2,134	327
1927		2,065	326
1928	3,341	2,126	332
1929	3,347	2,189	325

These figures speak for themselves.

The effect of the Basic Science Law on admission of chiropractors to practice in the State has been that from 1922 through 1927 there was an average of 38 per year. Since the passage of the Basic Science Law they have averaged one per year.

Since the passage of the revised Medical Practice Act, the attorney for the Board of Medical Examiners reports on two years' work as follows:

98 cases investigated
27 cases in court
23 convictions
2 dismissals
2 not guilty

and in addition 16 have left the state and one has quit entirely.

This work has been possible because of the revision of our Medical Practice Act due to the work of the Committee on Legislation of the State Association.

Without our Legislative Committee the chiropractors would have reduced their study from 24 to 18 months. Osteopaths and chiropractors would be practicing in our tax supported hospitals. An anti-vaccination bill would be in force. An anti-vivisection law would be in force. Naturopaths would be legally licensed to treat the sick in Minnesota. Full time University and state asylum physicians would be prohibited from accepting fees for any private work. Malpractice suits could be started within a six year period from the time the alleged malpractice occurred. It is a well known fact that in the time when the period was six years, instead of two years, that the majority of suits were started after the two year period. If the law had not been changed it is probable that our malpractice insurance would now be costing double what it does. The difference would be a greater sum than our annual dues of $15.00 to the State Association. In addition note the Ramsey County report for 1929. Not one malpractice suit filed against a member during the past year. An attempt was made at the 1929 session of the Legislature to go back to the six year period but this was defeated.

Before your Legislative Committee had money with which to work (in 1923), the osteopath was granted the right to practice minor surgary, administer anesthetics, narcotics and antidotes. In 1929 a bill granting still more legal rights was defeated.

In 1929 the venereal disease laboratory of the State Board of Health at the University was continued in operation largely through the efforts of the Legislative Committee.

In 1927 the Committee aided in securing an appropriation of $25,000 for research work at the University.

If it were not for your Legislative Committee, your fees for work done under the Workman's Compensation Law would now be dictated to you by the State Industrial Commission.

The atmosphere created by the Legislative Committee made easy the passage of the bill giving legal status to the staff of the Ancker Hospital and accounts for its present organization.

The passage of the Massage Bill at the 1929 session was done in the face of almost insuperable obstacles. This has far greater significance than the majority of medical men in Minnesota realize. Under the old Massage Law nearly every irregular who wanted to treat the sick could get a massage license and then assumed the title of Doctor. The result of two years of the operation of the law was deplorable. During the first eighteen months the old Massage Board licensed 269 to practice. Today there are 209 licensed masseurs in Minnesota. The new law places the licensure in the hands of the State Board of Medical Examiners and prohibits their use of the title of Doctor. We never had any quarrel with legitimate masseurs.

The Legislative Committee of the State Association has done this work for the people of the State of Minnesota and the members of the profession. The Council of the State Association has the utmost confidence in the expending of this fund by the Legislative Committee—however, the Chairman of the Legislative Committee has always insisted that members of the Council audit and inspect the accounts and such an audit and inspection has always been so conducted.

The activities of the Committee on Public Health Education are so many and varied that a brief description is impossible. Within the past ten years medical men throughout this country have awakened to the

necessity of maintaining contact with the public and we believe that the work of this Committee through the channels of the press, the radio, the distribution of literature and the lecture platform ranks well to the front among the states of the Union.

Your State Association has, as a Reserve Fund in securities, handled by the First Minneapolis Trust Company a total amount of $22,500.00. This money cannot be expended except for investment and re-investment without a vote of the Council. The beginnings of this sum go back to the time that Dr. Hill of Minneapolis was treasurer and represent careful savings over a long period of years. We don't know what this will ultimately be used for. When it increases to a sufficient sum the House of Delegates may instruct the Council to use the interest for the support of some physicians who have reached a helpless old age and have nothing of their own. The existence of this fund needs no defense. Criticism of the existence of this fund is almost beyond comprehension.

The Medical Society of the State of New York has annual dues of $10.00 per member but with 11,960 members this amounts to $119,600 annually. The osteopaths of Minnesota assess their members $20.00 per year, the chiropractors $15.00 per year, and the naturopaths, who have struggled for the past three legislative sessions for legal recognition, have dues of $200.00 per year. In Toledo the physicians pay $35.00 per year, in San Francisco $50.00, Brooklyn $35.00, Atlanta $25.00, Detroit $30.00, Fort Worth $25.00, Kansas City, $25.00, Portland $25.00, Richmond, Va., $25,00, and St. Louis $30.00.

We are faced with the question of whether or not we shall maintain an aggressive front in guiding legislation vital to the public and our interests and in the matter of public health education and in other fields of activity by maintaining our dues as they are; or shall we retrogress, stop our contact with the public, let every quack flood the Legislature with cult legislation, and try to forget that by virtue of our training in a special field we have a duty to the public in matters of public health.

Sincerely yours,
F. J. Savage, M.D.,
Councilor, Fifth District.

A motion was made and carried that the report be adopted as read.

President Boyer: The report is adopted, and is now open for discussion.

In connection with the relief for veterans of the World War, I don't think the American Medical Association House of Delegates took any action on this. Some man got up and offered this solution to the problem: He said, "Issue to these veterans a policy similar to a sick and accident policy and let them do what they do when they have an accident in civil life. Have a regular family physician and a regular hospital and make a claim to the Government." That seemed to me to be very feasible. I don't remember any action being taken on it.

Dr. Manley: The next is the report of the Treasurer. Without going into details, the receipts as given are $39,527.66; expenditures in 1929, $38,234.19; balance December 31, 1929, $1,293.47.

President Boyer: Dr. Schulze, will you please read your report.

TREASURER'S REPORT, YEAR 1929

In re: Treasurer's Statement year ending Dec. 31, 1928

Item-checks outstanding December 31, 1928		$2,490.29
Checks outstanding our books Dec. 31, 1928		
	$2,016.27	
	$2,016.27	
Checks outstanding Treasurer's Books Dec. 31, 1928		
$2,490.29	(No. 68, January check)	
1,000.00		
$1,490.29	(No. 71 to No. 75	
525.98	December checks entered in January)	
$2,016.27		

December receipts deposited in January amounting to	$375.00	
Bank Balance Dec. 31, 1928	$6,018.36	
Checks outstanding Dec. 31, 1928	2,016.27	
	$4,002.09	
December checks deposited in Jan.	375.00	
Treasurer's Funds as per our books Dec. 31, 1928	$4,377.09	

RECEIPTS

Balance on hand Dec. 31, 1928		$4,377.09
Membership dues—		
January	$15,525.00	
February	11,595.00	
March	1,440.00	
April	526.00	
May	450.00	
June	120.00	
July	90.00	
August	285.00	
September	126.00	
October	48.75	
November	45.00	
December	525.00	
		$30,775.75
Interest checking fund		116.96
Interest savings fund $10,000.00 at 4% 6 mos.	$200.00	
Interest savings fund $2,500.00 at 4% 3 mos.	25.00	
		225.00
Minnesota Medicine Subscription		4.00
Minnesota Medicine 1928 profits		916.11
Refund from Public Health Education Committee	$3.00	
	1.25	
	25.00	
		29.25

Annual Meeting Minnesota Alumni Association Luncheon		115.50
Annual Meeting Minnesota Alumni Association Luncheon paid direct		3.00
Borrowed—Nov. 30, 1929 $1,000.00 —$10.00 Int.	990.00	
Borrowed—Dec. 31, 1929 $2,000.00 —$25.00 Int.	1,975.00	2,965.00
		$39,527.66
Expenditures—1929		38,234.19
Balance December 31, 1929		$1,293.47

CASH DISBURSEMENTS

A. M. A. Delegates	$397.52
Annual Meeting	2,039.61
Auxiliary	76.78
Committee on Contract Practice	12.90
Council	187.46
Education	18,361.52
Furniture and Fixtures	44.00
Historical Committee	152.64
Hospital and Medical Education Committee	333.75
Legal	832.98
Minnesota Medicine	4,110.50
Miscellaneous	967.51
Miscellaneous Printed Matter	187.87
Public Health Education Committee	4,304.15
Rent	300.00
Secretaries' Conference	501.31
Secretary's Salary	3,000.00
Secretary's Traveling Expenses	338.39
State Health Relations Committee	126.21
Stenographers and Clerks	1,783.09
Notes Payable	------
Treasurer's Salary	100.00
Refunds to Local Societies	76.00
	$38,234.19

CHECKS OUTSTANDING DECEMBER 31, 1929

Minnesota Public Health Association, No. 234	$361.35
Wm. B. Joyce & Co., No. 235	12.50
H. M. Workman, No. 236	35.95
Pollock's Clipping Bureau, No. 237	15.95
Fred L. Holmes, No. 238	50.00
A. G. Schulze, No. 239	80.00
Minnesota Public Health Association, No. 240	240.00
Bruce Publishing Company, No. 243	106.00
Wm. A. O'Brien, No. 246	180.00
	$1,081.75
Balance as per books December 31, 1929	1,293.47
Balance as per bank December 31, 1929	$2,375.22

A. G. Schulze, M.D., *Treasurer.*

Dr. Manley: We recommend the adoption of the report.

President Boyer: I wish to state that the report has been studied in detail by the Council. Is there any discussion of the report? If not those in favor of the motion will so signify.

Motion to accept the report was carried.

Dr. Manley: Next is the report of the Committee on Public Health Education.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

To Members of the House of Delegates:

The Medical Profession should have a definite policy in regard to its relation to the public. No one is better qualified than the graduate licensed medical man to direct the public in health matters. Any progress in the end will be largely dependent on the attitude, scientific ability and coöperation of the two thousand individual members of the State Association in solving the public health and economic problems. The public is interested in the care and cost of being sick. The medical man is facing a rapidly changing set of circumstances as regard his practice.

This committee was primarily organized to assist in creating public opinion favorable to scientific health legislation. While medicine has a scientific side it also has economic problems and the two never have been and cannot now be separated. Many organizations except that of the medical men themselves have been busy for years in directing medical practice, as evidenced by lay public health associations such as tuberculosis associations, the cancer group, child welfare, the endowed foundations such as the Milbank Memorial Fund with its millions and the Chicago Institute that was so much in the public eye a year ago. Tax supported agencies, federal, state, county, and city, are taking increasingly active interest in public health. The above agencies and organizations are no doubt sincere in their purposes even though medical men have not always been in accord with their policies. Then we come to those organizations that are distinctly questionable as represented by the cultists, fake health magazines, anti-vaccinationists, and what not.

The committee, having limited funds and no experience, spent its first year largely in an analysis of the situation, conferring with lay experts and securing criticisms and cross sections of opinion from members of the State Association as to policies and methods to be pursued. It was not until after having interviewed in small group meetings a considerable cross section through the state that definite plans were set in action.

By 1930 the following activities were taking place:

Hygeia and *Everybody's Health* sent to members of the Legislature so that they may be properly informed on matters of health.

Radio talks have been given weekly over WCCO. These are financed by the Committee.

Speakers Library.—Folders on 263 subjects are on file and upon request material is sent to members of the Association.

Speakers Bureau has not been extensively developed because of the expense involved in sending out speakers.

Meetings.—During the year a two weeks Health Tour was put on with the coöperation of the Minnesota Public Health Association, various local Parents-Teachers Associations, and school superintendents. Public Health and Medical Economics meetings were held at

Wadena, Moorhead, Crookston, Bemidji, Worthington, Alexandria, Marshall, Montevideo, and Fergus Falls.

Minnesota Public Health Association and its eighty-seven county public health associations, through them the tuberculosis sanatoria and with them contact with the Parents-Teachers Associations, and the Women's Federated Clubs, and numerous school systems, have been advantageous to use in putting across our part of the Public Health Education Program. The joint secretaryship of Dr. Meyerding makes it possible for the Minnesota State Medical Association to put on programs that are comparable to those put on by other medical associations and obtain results that would otherwise be impossible.

Stenographic Help.—This committee is charged with the services of a full time stenographer, a part of whose time has been given to the work of other committees having no budget, thereby correlating the work of some of these committees whose interests touch on the matters of our relations with the public.

Minnesota Medicine.—A page each month in this journal is devoted to the activities of the Committee; it is an open forum and acts as a clearing house for many of the problems studied by the committee.

Diphtheria Prevention Campaign.—The attention of the profession has been repeatedly called to this campaign with the suggestion that they prepare themselves to follow out the plan of immunizing every child between the ages of six months and eighteen months. The Minnesota Department of Health has sent to all the physicians of the state literature and posters. This fall the Committee in conjunction with the Minnesota Public Health Association will send out a poster.

Newspaper Service.—A weekly health story was mailed to 270 newspapers in Minnesota. The stories are now being written in the secretary's office.

Mr. Brist.—One of the most effective educational activities has been the sending of Mr. F. Manley Brist, Investigating Attorney for the Minnesota State Board of Medical Examiners, before medical and lay groups. During the year he has appeared before 16 county societies, before various luncheon clubs, the Women's Auxiliary. In Mr. Brist and his talks we have a striking example of the results accomplished by the program of the Minnesota State Medical Association during the past years. Mr. Brist brings before these groups the direct accomplishments of the new Medical Practice Act and the Basic Science Law. The Committee on Public Health Education finances this part of the program.

Central Health Council.—This is an important but difficult liaison that should function to secure more intelligent public health activities, but has not yet been well organized in Minnesota.

Public Health Nurses.—The committee has coöperated with the Committee to Study Public Health Nursing Problems. Conferences were held to bring about closer coöperation between the Public Health Nurses and the medical profession and to make it possible for the Public Health Nurses to accept the viewpoints of the medical profession in regard to Public Health.

Coöperation with the Committee on the Cost of Medical Care.

Coöperation with the Women's Auxiliary and participation in its program.

Minnesota State Fair.—About three years ago the Minnesota State Fair Board abolished health meetings and health exhibits at the Minnesota State Fair. These exhibits were placed without expense to the Fair Board by various organizations interested in Public Health. The Board, however, did furnish exhibiting space. Some of the organizations participating in this exhibit were: Medical School, University of Minnesota, Minnesota State Medical Association, Minnesota Dental Association, Hennepin County Tuberculosis Association, Minnesota Nurses Association, Minnesota Public Health Association, Ramsey County Public Health Association, and Minnesota Department of Health. The Committee recommends that a resolution be sent to the State Fair Board asking it to consider the possibility of re-establishing the Public Health Building. Health Education is essential to the welfare of the people in Minnesota and we feel that we should make an effort to bring about again this plan that proved successful several years ago.

The committee has advocated the adoption of the Hennepin County Medical Society's plan of coöperation with lay health organizations and has urged every county society to adopt this plan of having medical men on the Boards of Directors of all lay health organizations in their county.

Throughout the three years of activities there has been an effort made by the committee to enlist the criticism and support of every member of the State Association as we realize that results will be accomplished on the question of our relations with the public and the practice of medicine only in proportion to the interest the individual practitioner takes in his contacts with the patient and the public; in other words, the contribution each one of the two thousand men of the State Association makes toward solving economic and public health problems that affect both the medical practitioner and the patient. The small group meeting has done more to eliminate petty local disagreements among medical men and to clarify their thinking on public health and medical economics than any other activity of the Committee.

The forces of state, industrial, and insurance medicine, the large endowed philanthropies, free clinics and complicated equipment used in modern practice are vitally influencing scientific medicine, economics and public health. The Medical Profession must be organized and have definite policies if it is to have any share in determining:

1. Who Shall Control the Health Policies?
   a. The Laity?
   b. Charlatans?
   c. The Medical Profession?
2. What Shall These Health Policies Be?

Respectfully Submitted,

H. B. Bailey, J. S. Holbrook,
R. O. Beard, John A. McIntyre,
B. J. Branton, F. H. Magney,
Henry W. Cook, F. H. Neher,
C. O. Estrem, Theodore Sweetser,
H. F. Helmholz, George Earl, *Chairman.*

Dr. Manley: This is a particularly full and complete report and the Reference Committee wishes to commend the Public Health Committee on the excellent work done. We approve a recommendation of the committee that a resolution be sent to the State Fair Board asking them to consider the possibility of re-establishing a Public Health Building which was abolished three years ago.

President Boyer: You have heard the report. What shall we do with it?

A motion was made and carried that the report be accepted.

Dr. Earl (St. Paul): I have a copy of the Minneapolis Tribune which carries an advertisement of "Theronoid" which bears the endorsement of the Women's Federation of Clubs. If you men don't know what Theronoid is, it is supposed to relieve catarrh, rheumatism, high blood pressure and many other ills. That problem we have to return for some consideration by Hennepin County itself and also take it up with the Women's Auxiliary.

The studies now being made by the Committee on the Cost of Medical Care are placed in three groups:

1. Survey of data showing the incidence of disease and disability requiring medical service and of extending facilities.
2. Studies of the cost of medical service and returns to the agents furnishing such service.
3. Analysis of significant special experiments in provision of medical care.

While no definite report has been completed to date solving the problem of cost of medical care, all who are interested in the cost of medical care have an opportunity to express opinions as to the improvements that can be made and disadvantages of already selected courses of procedure prescribed by others.

In this state we have this unique relationship with the public health agency, and we believe that by working the two together we are able to receive the most efficient results.

I know everybody in this room received a copy of the Graphic, and you can't pick up the Kiwanis Magazine or any other magazine nowadays that there isn't an article in it by somebody on the cost of health.

While it is true that economics is the basis of all progress, the factors underlying the problem of health and sickness are, first, finding human happiness through efficient medical services, and, second, an economic factor. Now, scientific knowledge, ability, simplicity of diagnosis and more efficient care and treatment have progressed to a place where only the economic factor blockades the pursuit of the patient of moderate means in finding human happiness. You might be interested to know that in this analysis it is stated that the doctor's share of the cost is 17.6 per cent, or between one-sixth and one-fifth of the total cost goes to the doctor. Private duty nurses get 8.2 per cent; practical duty nurses, 5.8 per cent; attendants, 4 per cent; dentists, 5.8 per cent; hospitals 29.3 per cent; druggists and medicines, 27.3 per cent. You see, the cost for drugs and medicines is 27 per cent as compared with 17 per cent that goes to the doctors. Of course, that is the great quack medicine graft. Chiropractors and osteopaths, 2 per cent. The total approximated cost of medical care secured from Dr. W. S. Rankin's report in the American Journal of Public Health, April, 1929, totals $2,500,000.00. In addition to the expense of medical care there is a great loss to the people of the United States from decreased earning capacity, and this is estimated at $2,000,000.00, which is estimated at 44.4 per cent of the total cost of illness. The average wage earner, according to the United States Bureau of Labor statistics, pays $60.39 a year for medical service, which is 55.6 per cent of the total cost of illness to the average individual.

How is this going to be met? None of us feel that the hospitals are trying to profiteer, but there may be some leaks. Is it reasonable to suppose that is the only solution? And we have industries and department stores that are providing health service. Probably some type of insurance as Dr. Meyerding mentioned for the veterans is the best. Increasingly the hospitals are hiring full time salaried doctors with offices in the hospital, operated for non-profit, or rent offices to doctors practicing for fees.

Many anticipated solutions to find ways and means to reduce the burden of cost to the patient of moderate means are being tried out. Hospitals are providing greater spread of rates, eliminating or combining special charges. Flat rates and sliding scale of charges are provided for individuals according to their means or ability to pay. Long time payments or the installment system is being tried with hospital charges.

The question has been asked by some of our leading authorities regarding hospital and medical costs, whether the patient of moderate means could pay for his medical care even if the entire hospital and medical world would adopt every one of the new policies outlined in this study? No one is able to answer this question for the present. No one knows what the individual can afford to pay. While the income of the general middle class is approximated from less than $1,000 to $3,000 per annum, the economic ability of the individual must be considered when individuals have different tastes and modes of living, and depends greatly on his ability to pay for medical care. If the individual is an appreciative type for the service rendered to him and has a knowledge that the cost is not exorbitant, he is most willing that the accounts for medical attention be given his immediate consideration. The individual who is willing to forego minor comforts and luxuries will meet the cost of medical care with little difficulty.

The attention of an individual, recently, has brought this matter to a degree of enlightenment. This individual had a compound spiral fracture of the leg. His hospital bill amounted to approximately $250.00 and the doctor, at that time, had not sent him a statement. He borrowed funds and together with the small amount of his savings, paid the hospital bill promptly. Thereupon, he borrowed $100.00 from a loaning agency and paid the bone specialist. After paying this amount

back on payments of $5.00 a week, he again borrowed $100.00 and paid his family physician.

Relative costs are not high when one compares our modern standard of living today with that of twenty-five years ago. While there has been increased cost in living expense since the war, as well as increased cost in supplies and equipment to the hospital and doctor, there has been little increase in the cost of hospital care to the patient in a percentage of comparison to the increased costs of hospital operation, keeping in mind the cost of medical care of fifteen to twenty-five years ago with the average income of that time in comparison with today.

Perhaps state medicine, free or part free clinics, and hospitals would solve the problem of the high cost of medical care to the individual, but who is going to pay the actual cost of this service. It is unnecessary to state that there are tangible ways of reducing the cost of medical care through securing better management and control of hospital economies in refusing the patient unnecessary comforts, special nurses when not necessary and refusing private and semi-private rooms to individuals who cannot afford the more expensive rooms, and installing a system of group nursing. Hospitals are not profiteering although 29.3% of the medical costs are charged to hospital care.

Equal Distribution of Costs.—The unequal distribution of the cost of illness is perhaps more or less the source of our trouble. Canada has attacked this problem by taxing all citizens and sharing a portion of the medical costs. Public health and prevention of disease is now one of our tax supported movements. Is it reasonable to believe that we should come to an equal distribution in taxing all individuals to bear a portion of the burden of the cost of illness? In many industries and department stores group health and accident insurance are being purchased at an average cost of seventy-five cents per month to individuals. Some urge if such a plan were made effective to all individuals of the United States, hospitals, doctors and medical attendants would be assured of payment of their charges; free work to a large extent would be discontinued and patients would have the free choice of the doctor and hospital, if needed, and compensation insurance would be discontinued, which would provide increased wages to the employees and all members of the individual's family would be entitled to insurance on this proposed agreement.

This form of distribution of costs appears to be the most favorable that would aim to work out with little difficulty and would provide a greater degree of economic happiness to all.

Future of Medical Care.—According to the last report of the American Medical Association several of the small hospitals have been consolidated to provide less overhead and duplication of equipment. While mergers have their faults and failings, to a certain degree mergering does promote efficiency and reduces overhead costs. Probably the hospitals of tomorrow will include full time salaried doctors with offices in the hospital, operated for non-profit, or rent offices to doctors practicing for fees. As we take cognizance of the progress being made in the realm of medicine, we should be concerned with the trend of economic advances also. The hospital of tomorrow may embrace all of the medical units for complete medical care.

President Boyer: I think Dr. Earl stands prepared to answer any questions that any of you desire to ask. The Chair desires that you do ask questions.

Dr. Wright: If one can first determine the major costs of medical practice something may be accomplished. In the first place there is expense incurred through loss of time by the injured employe. A prolonged stay in the hospital is another expense, and this might be reduced by establishing a type of hospital which is less expensive, similar to the convalescent hospitals in New York. Another problem is use of patent medicines. I think Dr. O'Brien is attacking this in a very intelligent and helpful manner. Dr. Earl and his committee are doing a tremendous work along this particular line in the way of popular education.

President Boyer: Dr. Locken.

Dr. Locken: I might just say one thing that has been my personal experience. I have served as chairman of the Committee on Public Health of the League of Minnesota Municipalities for the past eight years. I have given them a report each of those eight years. We have started this work out from nothing, until the past year they made the public health one of the main considerations of their program for the coming year. I think the important thing of this whole endeavor of the medical profession in getting contact with the public is to come out frankly and present problems of public health to the people in just these ways. I found a very anxious interest to know more about these things on the part of the people. As we do more of that work we will find we will have to spend less money on our actual legislative programs. I think we have had to force it down their necks in the past years because there has been so little preliminary work. But I think in future years we will never have to do this if we first give them some of the information they are entitled to. The fact that we have spent so much money on the Legislative Committee in the past year means that we are just turning over the soil for the first time. I think if we go at this in the right way it will bring increased benefits in the future.

President Boyer: To accept the report of this committee is tantamount to approving the continuation of the committee and the continuation of the expense. We would like to have others ask questions and make remarks before we dispose of this report. We have an exhibit from the American Medical Association in the display here in which Theronoid and Pfunder's pills are touched upon.

Dr. Pearce (Minneapolis): The matter of the Pfunder tablet has been up many times before the Hennepin County Medical Association. In our opinion, at least, we have felt the best thing to do was to do nothing, that any attempt on our part to fight that thing merely serves to advertise it more. The newspapers of Minneapolis have been coöperating with us, and a great many advertisements of that character have been turned down by them. I don't think we appre-

ciate sufficiently the work Dr. O'Brien is doing on the radio. All those who listen to the merits of Sargon as broadcast on KSTP should appreciate the fact that WCCO allows a censorship of these things by Dr. O'Brien, and I think we should go after KSTP and try to get them to permit the same thing, but otherwise I think we should ignore it.

The report was here accepted by a vote.

PRESIDENT BOYER: The Reference Committee.

DR. MANLEY: Next is the report of the Editing and Publishing Committee.

REPORT OF EDITING AND PUBLISHING COMMITTEE

January 1, 1929, to December 31, 1929

In presenting this, the twelfth annual report on the publication of the Association's journal, MINNESOTA MEDICINE, for the calendar year 1929, this Committee is pleased to announce that the journal continues to operate at a profit, the cash receipts for the year being $1,081.52 in excess of expenses. This amount has been remitted to the treasurer of the Association. The net cash receipts for 1929 showed a gain over the preceding year.

The twelve issues of the journal included in Volume XII, 1929, contained a total of 1,244 pages, an average of 103.6 pages for each month. Of this total, 820 pages were devoted to reading matter and 424 pages to advertising, an average for each monthly issue of 68.3 pages of reading matter and 35.3 pages of advertising. Had all the editorial material supplied readers of the journal during the year been published in book form, it would have made a volume of 1,000 pages with nearly 200 illustrations.

The total number of articles published during the year was 129, of which 28 were case reports, and one article by a layman. Other case reports and discussions of interest not listed as individual contributions appeared in the Proceedings of the Minnesota Academy of Medicine and the Transactions of the Minneapolis Surgical Society. The total number of illustrations included in all articles published was 195, an average in excess of 16 for each issue.

In April, 1930, the vacancy in the editorial staff left by Dr. F. W. Schlutz, who is now located in Chicago, was filled through the appointment of Dr. Lewis M. Daniel of Minneapolis as Assistant Editor in charge of the abstract department. Dr. Daniel has already communicated with the supervisors of the various sections in the abstract department and through their cooperation hopes to continue this section as a leading department in the journal.

An effort is being made this year to create more interest through the offices of the Associate Editors in the general news items published. Each Associate Editor has been urgently requested to collect items of interest concerning members in his particular district, sending them in for publication at a stated time each month. While news items have been received intermittently from the Associate Editors in the past, it is felt that a definite time and amount of material required will do much to improve the department of General Interest items during the coming year.

It is gratifying to report that MINNESOTA MEDICINE continues to be regarded as one of the best of the state medical journals. Since the publication was established more than a dozen years ago, earnest efforts have been made to maintain a high editorial standard. Advertising has been carefully censored, and with rare exceptions nothing has appeared in the columns of our state journal not conforming to A. M. A. standards. The American Medical Association tells us that the journal is highly regarded among the better class advertisers. Undoubtedly our advertising volume could be materially increased were we willing to accept border line advertisements.

The circulation of MINNESOTA MEDICINE for the year 1929 is reported as follows:

Members (paid)	2,058
Members (delinquent)	140
Outside subscriptions	118
Miscellaneous copies distributed (exchanges, complimentary copies, advertising copies, etc.)	289
Surplus on file	120
	2,725

The following report of receipts and disbursements was submitted to the secretary of the Association in January, 1930:

Cash Receipts

Subscriptions, Members	$ 4,116.00	
Subscriptions, Non-members	428.20	
Advertising	9,294.79	
Advertising Dividend	377.53	
Illustrations	5.58	
		$14,222.10

Disbursements

Journal expense	$11,953.89	
Discounts allowed:		
Advertising	$1,172.29	
Subscriptions	14.40	
	1,186.69	
		13,140.58
Surplus cash in bank		$ 1,081.52

Respectfully submitted,

EDITING AND PUBLISHING COMMITTEE.

J. T. CHRISTISON, *Chairman.*

DR. MANLEY: The Reference Committee recommends the adoption of this report, with the following recommendation:

In view of the rapidly changing economic conditions affecting the medical profession, and its many great problems constantly presenting themselves for solution, we believe that more attention should be given to the consideration of economic problems in the State Journal and that more space should be devoted to questions aside from the scientific side of medicine. The Committee also recommends that some consideration be given to the question of employing a special editor for this purpose.

A motion was made and carried that the report be accepted.

Dr. Drake (St. Paul): I want to thank the members for their support of the magazine and want to ask their continued support.

Dr. Manley: We now have the Necrologist's report.

NECROLOGIST'S REPORT

June, 1929, to May, 1930

MEMBERS OF MINNESOTA STATE MEDICAL ASSOCIATION

F. A. Allen, Ironton. Born 1876. George Washington University of Medicine, 1905. Died May, 1929. Age 53.

Louis N. Benepe, Saint Paul. Born 1862. Missouri Medical College, St. Louis. Died Feb. 14, 1930. Age 68.

Floyd E. Best, Wells. Born 1887. Northwestern University, 1911. Died Nov. 9, 1929. Age 42.

C. W. Bjorgo, Cannon Falls. Born 1881. Rush Medical, 1918. Died May 7, 1929. Age 48.

William J. Byrnes, Minneapolis. Born 1859. University of Michigan Medical School, 1882. Died Nov. 4, 1929. Age 70. Past President Hennepin County Medical Society.

Charles L. Carman, Saint Paul. Born 1859. University of Minnesota, 1897. Died Dec. 13, 1929. Age 70.

Alva A. Conley, Cannon Falls. Born 1890. University of Minnesota, 1914. Died March 11, 1930. Age 40.

Paul Burns Cook, Saint Paul. Born 1877. University of Minnesota, 1900. Died Feb. 9, 1930. Age 53. Vice President Ramsey County Medical Society.

Horace S. Davis, Duluth. Born 1855. Ann Arbor, Dartmouth, 1884. Died May 4, 1929. Age 74.

W. G. Eisenman, Chisholm. Born 1885. University of Michigan, 1909. Died Dec. 9, 1929. Age 44.

Louis McCargo Fowler, Rochester. Born 1901. University of Pennsylvania, 1924. Died July 1, 1929. Age 28.

Liston Q. Greeley, Duluth. Born 1868. University of Minnesota, 1897. Died Sept. 23, 1929. Age 61.

H. N. Hovde, Duluth. Born 1861. University of Oslo, Norway. Died Dec. 24, 1929. Age 68.

John H. James, Mankato. Born 1846. New York University. Died Sept. 19, 1929. Age 83.

Aloysius Julius Kaufman, Franklin. Born 1875. University of Pennsylvania Medical School, 1899. Died March 23, 1930. Age 55.

A. A. Law, Minneapolis. Born 1872. University of Minnesota 1894. Died July 9, 1930. Age 58. One of the founders of the American College of Surgeons.

Arthur E. Lund, Saint Paul. Born 1890. Rush Medical College, 1925. Died Aug. 10, 1929. Age 39.

Charles Stanley McVicar, Rochester. Born 1880. Western Medical College, London, 1904. Toronto University, 1907. Died June 29, 1929. Age 49.

Marion A. Mead, Minneapolis. Born 1860. Women's Medical College of the N. Y. Infirmary for Women and Children, 1895. Died Sept., 1929. Age 69.

A. G. Moffat, Howard Lake. Born 1865. University of Minnesota, 1895. Died Dec. 18, 1929. Age 64. President Wright County Medical Society.

Louis A. Nippert, Minneapolis. Born 1860. Miami Medical College of Cincinnati University, 1883. Died Nov. 6, 1929. Age 69. President Hennepin County Medical Society. President Minnesota Academy of Medicine.

C. K. Onsgard, Halstad. Born 1863. Eclectic Medical College of Cincinnati, 1887. Died Nov., 1929. Age 66.

C. Eugene Riggs, Saint Paul. Born 1853. College of Physicians and Surgeons, Baltimore, Md., 1880. Died April 3, 1930. Age 77.

Olaf Thorstein Sherping, Fergus Falls. Born 1864. Keokuk Medical College, 1893. Died Dec. 7, 1929. Age 65.

Peter Theodore Torkelson, Lyle. Born 1881. University of Illinois Medical College, 1908. Died Feb. 18, 1930. Age 49.

J. P. Von Berg, Albert Lea. Born 1858. Hahnemann Medical College, Chicago, 1884. Died Dec. 5, 1929. Age 71.

Henry E. Webster, Duluth. Born 1862. University of Toronto, 1884. Died March 7, 1930. Age 68.

Mary J. S. Whetstone, Minneapolis. Born 1849. University of Michigan, 1882. Died Oct. 24, 1929. Age 80. Vice President State Medical Association.

Arthur W. Whitney, Saint Paul. Born 1864. Queens College, Kingston, Ontario, 1888. Died Sept. 14, 1929. Age 65.

L. L. Gibbon, Lowry. Born 1875. University of Minnesota, 1897. Died 1930. Age 55.

PHYSICIANS NOT MEMBERS OF STATE ASSOCIATION AT THE TIME OF THEIR DEATH

Joseph T. Asbury, Rochester. Born 1875. College of Medicine of the University of Illinois, 1902. Died July, 1929. Age 54.

Joseph E. Campbell, Melrose. Born 1853. Died March, 1930. Age 77.

Daniel C. Darrow, Crookston. Born 1850. Died Jan. 10, 1930. Age 80.

John Ekrem, Gully. Born 1866. Minneapolis College of Physicians and Surgeons, 1903. Died May, 1930. Age 64.

Lorenzo A. Gray, Fairmont. Born 1899. Died Feb. 27, 1930. Age 31.

Henry F. Hoyt, Long Beach, California. Born 1854. Rush Medical College. Died Jan. 21, 1930. Age 76.

Ethel Hurd, Minneapolis. Born 1846. University of Minnesota, 1897. Died Aug., 1929. Age 83.

E. R. Jellison, Minneapolis. Michigan, 1883. Died Jan. 27, 1929.

Hugo H. Miller, Minneapolis. Born 1865. Minneapolis College of Physicians and Surgeons, 1892. Died Sept. 4, 1929. Age 64.

Louis L. Moench, Waterville. Born 1875. Eclectic Medical College, Cincinnati, 1902. Died June 2, 1930. Age 55.

James B. Muir, Roseau. Born 1860. Bennett Medical College, Chicago, 1885. Died Oct., 1929. Age 69.

William B. Murray, Minneapolis. Born 1862. Minneapolis College of Physicians and Surgeons, 1890. Died Aug., 1929. Age 67.

N. A. Nelson, Dawson. Born 1855. King Eclectic Medical College, 1884. Died Sept., 1929. Age 74.

Francis M. Prettyman, Northfield. Born 1850. Died Feb. 13, 1930. Age 80.

James A. Rippert, Duluth. Born 1886. College of Physicians and Surgeons, Baltimore, 1910. Died July, 1929. Age 43.

C. L. Schneider, Deer Creek. Born 1873. Wisconsin College of Physicians and Surgeons, 1902. Died Sept., 1929. Age 56.

Samuel M. Stocker, Fergus Falls. Born 1857. New York University Medical College, 1885. Died Nov., 1929. Age 72.

P. A. Walling, Park Rapids. Born 1850. University of Buffalo, 1876. Died May, 1929. Age 79.

Charles W. Watson, Minneapolis. Born 1867. Minneapolis College of Physicians and Surgeons, 1897. Died May, 1930. Age 63.

George O. Welch, Fergus Falls. Born 1860. Boston University, 1887. Died June, 1929. Age 69.

George J. Wilson, Moorhead. Born 1835. Died Sept., 1929. Age 94.

E. W. Young, Minneapolis. Born 1852. Minneapolis College of Physicians and Surgeons, 1896. Died Feb. 19, 1930. Age 78.

Benjamin M. Randall, Graceville. Born 1858. Rush Medical College, 1883. Died May 24, 1930. Age 72.

Some had carried the honored name of physician but a few years of their youth, some through the many years of their maturity. To each is applicable the kindly description of the ancient poet, "It was his part to learn of the power of Medicine and of the manner of healing, and, heedless of Glory, to exercise that quiet art" (Virgil).

OLGA S. HANSEN, *Necrologist.*

PRESIDENT BOYER: We will now stand with bowed heads for a moment in memory of our departed brethren.

The audience arose and stood in silence.

DR. MANLEY: Next is the report of the Historical Committee.

REPORT OF HISTORICAL COMMITTEE

Your historical committee desires to submit the following report. On three previous occasions, the committee has outlined its program for future activities, given the chapters under which the history is being prepared, told something of the search for material and reported the progress already made in different directions. It seems hardly necessary to repeat these statements.

Additional items of information are continually being brought to our attention and we wish particularly to express our appreciation on account of material relating to the very early physicians in this territory, obtained through the State Historical Society.

The task of putting the facts at our disposal into some sort of literary form is proving even greater than that involved in the original search for material and we are now informed that it will probably require quite one year for publication, even after the manuscript is complete.

In view of the above, the committee looks with some skepticism on its earlier somewhat rosy prognosis as to an early date of publication.

In the interim, the committee desires to call attention to what it considers an injustice done the pioneers who founded the first medical society in 1853. On July 23, of that year, sixteen medical men of the territory (Drs. Thos. R. Potts, James D. Goodrich, W. W. Finch, John J. Dewey, and T. T. Mann, of St. Paul; John H. Murphy and Charles L. Anderson, of St. Anthony Falls; A. E. Johnson, St. Anthony City; and Alfred E. Ames, Hennepin County, were actually present. Drs. A. W. Daniels, of St. Peter; MacDougall, of Fort Snelling; C. Carli, of Stillwater; and P. P. Marsh, J. H. Day, A. G. Brisbine and Samuel Willey, all of St. Paul, were made charter members on account of interest previously expressed in the organization) met in St. Paul and assisted in the organization of the Minnesota Medical Society. This is substantiated by the report in the lay press of that date (the St. Anthony Express, Vol. III, No. 10, July 30, 1853) and by a note in the Boston Medical and Surgical Journal, Oct. 12, 1853, from Dr. William W. Finch, of St. Paul. Officers were elected, committees appointed and a constitution and by-laws adopted. There is reliable evidence that subsequent meetings were held in 1856 and in 1867 and it is probable that still other meetings were held. Subsequently the society languished and finally ceased to function during the Civil War and up to 1869.

On Feb. 1, 1869, a meeting of the physicians of Minnesota was held in St. Paul. Considerable time was spent in discussing the question of whether they were reviving a preëxisting society or forming a new organization. The final action taken certainly endorsed the idea of forming a new society but a careful survey of the minutes of the meeting suggests little basis for the contention that a really new society was formed.

At this meeting of 1869, it was accepted that a "Minnesota State [?] Medical Society" had been formed in 1855. Though both name and date are incorrect, this obviously referred to the old society. In any reference to the society, found between 1853 and 1869, Dr. Thomas R. Potts, of St. Paul, appears as the President and Dr. John H. Murphy, of St. Anthony Falls, as the Vice President, and these two were accepted, by virtue of their previous positions, as the presiding officers of the new assembly. The Board of Censors of the old organization served in the same capacity for the new organization and proposed a list of names of those duly qualified for membership, which list was accepted. Even the old Constitution and By-Laws were adopted with no change except as to the date of meeting.

The Hennepin County Medical Society passed through a practically identical experience. On June 20, 1855, a society known as the Union Medical Society of St. Anthony and Minneapolis was organized at the home of Dr. A. E. Ames, in Minneapolis. Very much as the territorial and state organization had done, it struggled through the Civil War period with only occasional meetings. In March or April of 1869, it was renamed the Hennepin County Medical Society and in June of 1870 it was reorganized. Notwithstanding these changes in its name, its periods of service and its reorganization, the Hennepin County Medical Society has never hesitated to consider its birth date as June 20, 1855.

Considering, then, that a medical society was actually formed in Minnesota Territory in 1853, that it functioned more or less well as a pioneer organization to 1869, that the old officers held over even into the organization of the new society, controlling the methods of procedure and even censoring the names of applicants for admission and considering that the old Constitution and By-Laws were adopted without essential alteration, it is the opinion of your committee that these societies, practically alike in name, serving the same communities, actuated by the same principles, having the same officers and operating under the same Constitution and By-Laws, should be considered as one society and that the date of our founding be accepted as July 23, 1853.

A. S. HAMILTON, M.D., *Chairman.*

ADDENDA

It seems that the necrologist of this society could well be a member of the Historical Committee delegated by the chairman to tabulate the necrology reports. The work of the two committees overlaps and it would seem that the necrologist may be of some assistance in the collection of historical material.

DR. MANLEY: This is a very complete and comprehensive report, and the Reference Committee wishes to commend the Historical Committee. We also recommend the adoption of a resolution making the Necrologist of this Society a member of the Historical Committee. We also recommend, and I move, that the report be accepted.

PRESIDENT BOYER: Bear in mind that the recommendation to place the Necrologist on the Historical Committee really has to be accomplished by way of an amendment to our by-laws. It is needless to state that as a member of the Historical Committee the necrology reports will be handed in by way of that committee. Is there any further discussion?

DR. WORKMAN (Tracy): The first President of this Society was Dr. Potts. He was elected in 1853. The Society didn't meet every year, but along about the time of the Civil War members ceased to meet; they met again with Dr. Potts in the chair. They adopted the old by-laws and the old organization name and all, but in the reorganization they appointed a committee on credentials. In the written minutes this committee was appointed to eliminate certain men that were very irregular. It shows that in 1869 there were more irregular physicians in Minnesota than there were regulars, and that was one way of getting rid of them. That is why I move the adoption of 1853 as the year of the birth of this organization, and this would be the seventy-seventh meeting, and I make that as a motion.

Motion was carried.

PRESIDENT BOYER: As the acceptance of this report implies the amending of the by-laws, Dr. Coventry will write an amendment in conformity therewith.

DR. COVENTRY: Here is the amendment:

"RESOLVED, That Chapter IX, Section I, be amended by striking out the words 'A committte on Necrology' and that the duties of this committee be transferred to the duties of the Historical Committee."

A motion was made and carried that the report of the Historical Committee be accepted.

PRESIDENT BOYER: The Reference Committee.

DR. MANLEY: The report of the Radio Committee, Dr. S. R. Maxeiner, Chairman.

REPORT OF THE RADIO COMMITTEE

One hundred seventeen radio programs were broadcast under the direction of the Radio Committee from April 3, 1928, to June 1, 1930. With the exception of two programs from KSTP, all have been sent from Station WCCO.

The regular health service feature has been given every Wednesday morning at 10:15 with the exception of holidays by Dr. Wm. A. O'Brien, Associate Professor of Pathology, University of Minnesota. A list of the subjects follows: (1) The Modern Health Problem, (2) Well Balanced Diet, (3) Fresh Air, (4) Rest and Sleep, (5) Prevention of Diphtheria, (6) Typhoid Fever, (7) Maternal and Infant Hygiene, (8) The Goiter Problem, (9) Care of Wounds, (10) Rabies, (11) How We Breathe, (12) Diseases of the Liver, (13) Outlook for Young Diabetics, (14) Circulation of the Blood, (15) Vitamines, (16) How the Well Can Help the Sick, (17) What Is a Neurotic? (18) How We Hear, (19) The Cause of Cancer, (20) Cathartics and Appendicitis, (21) Factors in the Health Problem, (22) Cancer of the Stomach, (23) Correcting Nature's Mistakes, (24) Cause of Anemia, (25) Getting the Children Ready for School, (26) Heat Stroke and Exhaustion, (27) Obesity, (28) Cancer of Breast and Uterus, (29) Foreign Bodies in the Lungs, (30) Paralysis and Will Power, (31) Conquest of Tuberculosis, (32) Influenza, (33) Gas Poisoning, (34) Children and Tuberculosis, (35) Why We Worry, (36) Physical Activity, (37) What Is Arthritis? (38) Tularemia, A Disease of Man and Animals, (39) The First Year, (40) Fish as a Food, (41) Burns, (42) Ultra-Violet Rays, (43) Gallstones, (44) Care of the Feet, (45) What the Modern Hospital Means to You, (46) Problems of Maturity, (47) Fractures, (48) Varicose Veins, (49) Emotional Instability, (50) High Blood Pressure, (51) Medical Superstitions, (52) Mucous Colitis, (53) Hay Fever, (54) Ulcer of the Stomach, (55) Inflammation of the Middle Ear, (56) Prevention of Heart Disease, (57) Pasteurized Milk, (58) Adopting a Baby, (59) Rheumatic Heart Disease, (60) Ptomaine Poisoning (A Myth), (61) Eczema and Dermatitis, (62) First Aid, (63) Small Town Health Problems, (64) Fumigation, (65) Prevention and Early Treatment of Disease, (66) Hot Weather and Health, (67) How Long Will You Live? (68) Modern Treatment of Tuberculosis, (69) Babies in Hot Weather, (70) Need for a Psychopathic Hospital, (71) Diseased Tonsils and Adenoids, (72) Undulant Fever, (73) Cancer Facts, (74) Heart Pains, (75) Advances in Public Health, (76) Tetanus, (77) Catarrhal Deafness, (78) Pellagra, (79) Diseases of Allergy, (80) Story of Muscle, (81) Care of Feet and Legs in Diabetes, (82) Fall and Winter Babies, (83) When Deafness Comes, (84) Cirrhosis of the Liver, (85) Blue Ribbon Children, (86) Cause of Headaches, (87) Carbon Monoxide, A Menace, (88) Disseminated

Sclerosis, (89) Anesthesia, The Great Gift, (90) Cause and Prevention of Bunions, (91) Health and Safety, (92) Infantile Paralysis, (93) Preventable Blindness, (94) Pork Worm Disease, (95) Glaucoma, (96) Feeding the Problem Child, (97) Treatment of High Blood Pressure, (98) Dangers of Self-Medication, (99) Cause of Bronchitis, (100) Facial Paralysis, (101) Cancer Cures, (102) White Versus Brown Bread, (103) Safeguarding Motherhood, (104) Code of Medical Ethics, (105) Inflammation of the Mastoid, (106) Christmas Seal, (107) Measles.

In addition to the regular Wednesday morning feature from WCCO, the following programs have been sponsored: (108) Cosmetic Nostrums, Dr. Arthur J. Cramp, American Medical Association, (109) American College of Surgeons, David Jolly, Houston, Texas, (110) Periodic Health Examinations, Dr. W. D. Haggard, Nashville, Tenn., (111) Keeping Fit, Mr. A. R. Jones, Gorgas Memorial, (112) Teen Age Problems, Dr. W. A. O'Brien, Hennepin County T. B. Association, (113) Pre-School Child, Dr. W. A. O'Brien, Federation of Women's Clubs, (114) Installation of President American Medical Association, (115) Visiting the Sick, Dr. W. A. O'Brien, Minnesota State Hospital Association, (116) New Childhood, Dr. W. A. O'Brien, Minnesota Public Health Association, (117) Problems of Tuberculosis, Dr. F. M. Pottenger, American College of Physicians.

Censorship.—Station WCCO volunteered to turn over the problem of passing on all medical advertising to the Committee. Since then, nothing has appeared on the air from WCCO of objectionable nature, because of this arrangement. There was one program which was approved and later proved to be objectionable. This was because of misrepresentation on the part of the advertiser, and the station regrets it just as much as we do.

Publicity.—Good publicity has been received from all the papers and the station. Announcements of the programs appear in the press and are given over the air at frequent intervals. In addition, since January 1, 1930, all programs have been made in advance and are now published in Minnesota Medicine. More recently they have been carried by the Journal-Lancet and some of the newspapers. Everybody's Health now carries "Health from the Air" extracts from the programs since May 1, 1930.

Audience.—We are still reaching the state of Minnesota, parts of North and South Dakota, Iowa, Wisconsin, and northern Michigan. We have been informed that our audience has grown to a remarkable size and that the health service feature is now one of the main attractions of WCCO. Letters from interested listeners vary from four to three hundred per talk. When the audience is promised a copy of the talk, a large number write in; otherwise, few letters are received except those asking for advice and offering suggestions for future programs. As the program is part of the Women's Hour feature of the station, naturally, a large percentage of our audience is women. We believe this is very desirable as it is through the women that we reach the home and family. The number of convalescents, invalids, and shut-ins remains about the same. They have been very much interested in the talks and write frequently.

Our letters also indicate that a large number of men are now listening. This is very desirable, and the number could be increased by an evening feature. Many persons ask why we do not broadcast in the evening when they can remain at home and listen. It seems best at the present time to concentrate on the morning hour as we get a very desirable audience in this way, desirous of instruction. When the programs were first started, the station told us that if it was a success future prorgams could probably be arranged at different time. The Committee feels that it is now opportune for us to think about developing an evening feature as well.

The number of physicians who listen to the programs is probably not very great. This is undoubtedly due to the fact that the programs come in the morning when most doctors are busy; however, many doctors have written to assure us of their interest and hearty cooperation and state that they make a special effort to listen in to learn what the people are being taught. Any way that we could develop this feature would be most desirable, because it is felt that the suggestions we are making to the public should be known to the doctors.

The air is polluted at the present time with all sorts of quackery, and it is only through our service that we will be able to meet this form of opposition. Many of the other stations carry objectionable advertising programs, but it is very difficult to know what to do about it, as jurisdiction over this matter comes from two sources—the Federal Trade Commission and the Federal Radio Commission. The action of the American Medical Association on objectionable medical advertising is being watched with interest, and it will probably point the way to more effective censorship on the part of your Committee.

We wish to thank Station WCCO particularly for the splendid coöperation we have received. If we had to pay regular advertising rates for our time, it would have amounted to thousands of dollars. The Station has very gladly donated this because they appreciate that our Association is attempting to do a very worth while piece of work. It is now believed that we have over one million weekly listeners, and many of them listen with regularity. We are now entering on our third year of broadcasting and believe that the future holds still greater possibilities in store for us. The Committee feel that the service has been a marked success and urge that it be continued.

S. R. Maxeiner, M.D., *Chairman.*

Dr. Manley: The Radio Committee has done an immense amount of valuable work, and we wish to commend the work of this committee. We also wish to ask the House of Delegates to give Dr. O'Brien a vote of thanks for his radio health talks with which we are all familiar. He now has an immense audience and this is undoubtedly one of the most valuable methods of reaching the public which can be adopted.

The report of the Radio Committee was voted upon and accepted.

President Boyer: We would like to hear from Dr. O'Brien.

Dr. O'Brien (Minneapolis): We feel that we have gained ground the past year as we did the year before. We are adding new friends, and it was a pleasure to walk around the lobby today and to meet so many doctors who told me so many of their patients have been listening in and getting beneficial results from the talks. In addition to the women we are getting a large number of men who are now listening in. Because we have received so few criticisms in the past I am afraid not many doctors are listening, because if they were we would be getting letters stating that they did not like some of the things we said. I wish to state that at five o'clock this afternoon the Radio Committee will be talking over WEBC, Duluth. I thank you. (Applause.)

Dr. Manley: Report of the Committee on Hospitals and Medical Education, Dr. Pearce, Chairman.

REPORT OF THE COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

June 1, 1929, to May 31, 1930

Your Committee has been working in the past year much along the lines of the program that has been under way for the past several years. The three major activities of the Committee are the Extension Courses, the Colloquium Lecture Series, and the Consultation Bureau.

More Extension Courses have been carried on this year than ever before. It is unnecessary for me to repeat that these Extension Courses are a joint enterprise of the State Medical School, the State Medical Association, and the Extension Division of the University of Minnesota.

The Colloquium Lecture Series is not very different from the regular Extension Course except that it is designed to reach new groups whom we have been unable to interest in the regular courses. Also, in a general way, these courses were designed to correlate the programs of the State Medical Association, the Medical School, the State Board of Health, the Minnesota Public Health Association, and the University Hospital, and furnish an opportunity for these organizations to meet with the practicing physicians of the state. Five of these courses which were offered were quickly subscribed to, in three instances in places where we have never before been able to interest the men in an extension course. More of these courses will probably be offered this fall.

The demand on the Consultation Bureau has been growing slowly. There was a marked increase in interest after the blotters were sent out by Dr. Meyerding. The facilities of this Bureau are without doubt a most valuable source of prompt and reliable confidential information, and we believe in time will prove to be one of the greatest contributions of the State Association to its members. We should express our appreciation of the help and interest of the men who have so freely given their time in helping the Bureau answer the many queries, and to the physicians who have shown the same interest in sending them in.

Dr. O'Brien, the Director of the Bureau, expects to be able to show you a map designating the extension of the use of these services.

Attached to this summary of the report you will find a detailed account of the activities of the Consultation Bureau, the Extension Courses, and a brief outline of the work of the Colloquium Lecture Series which were given this spring at Wadena, Willmar, Litchfield, Faribault, Brainerd, and Winona.

Respectfully submitted,

N. O. Pearce, *Chairman.*

CONSULTATION BUREAU

March 21, 1929, to Sept. 20, 1929

Organized March 21, 1929.

First inquiry received within 24 hours after announcement; 55 inquiries have been received to September 20, 1929.

Types of inquiries received are as follows:

Case Reports—29; requesting general information, 5; requesting prognosis, 1; requesting diagnosis, 4; requesting treatment, 10; requesting diagnosis and treatment, 7; reading of dental films, 1; question of industrial disease, 1.

Publications—Books to buy, 3; where to publish articles, 1.

Apparatus and Appliances—3.

Medico-Legal—4.

Locum Tenens Appointment—2.

General—Treatment of diseases, 3; courses of study, 2; reliability of radium corporation, 1; state aid for charity patient, 1; patent medicine, 2; drugs, 1; therapy, 1; blood test to prove paternity, 1; use of Schick Test, 1.

Four cases were followed up by further inquiry.

Thirty-nine doctors have used the service.

Eleven doctors have sent in from two to four inquiries.

Number of inquiries received, according to month: March, 1929, 6; April, 1929, 15; May, 1929, 10; June, 1929, 6; July, 1929, 6; August, 1929, 6; September, 1929, 5.

Sept. 20, 1929, to May 20, 1930

Types of inquiries received are as follows:

Case Reports—66; requesting general information, 11; requesting diagnosis, 12; requesting prognosis, 4; requesting treatment, 26; requesting reading of dental films, 1; requesting reading of *x*-ray pictures, 1.

General—Information regarding schools, 1; information regarding books, 4; blood test to prove paternity, 2; patent medicine, 1; drugs, 1.

Medico-Legal—1.

Forty doctors have used the service.

Eleven doctors have sent in from two to six inquiries.

Number of inquiries received, according to month: October, 1929, 7; November, 1929, 4; December, 1929, 5; January, 1930, 7; February, 1930, 5; March, 1930, 3; April, 1930, 20; May, 1930, 15.

EXTENSION COURSES

June 1, 1929, to May 31, 1930

Olivia—April 19 to May 10, 1929; 18 registrations; 4 lectures; cost $70.00. Lecturers: Drs. Moses Barron, G. B. Eusterman, T. W. Weum, E. D. Anderson.

Willmar—May 23 to June 27, 1929; 14 registrations; 6 lectures; cost $75.00. Lecturers: Drs. C. N. Hensel

T. B. Hartzell, H. Z. Giffin, K. Bulkley, P. W. Giessler, E. M. Hammes.

Fulda-Worthington—September 3 to October 22, 1929; 35 registrations; 5 lectures; cost $112.50. Lecturers: Drs. E. Bannick, A. F. Bratrud, E. T. Evans, T. W. Weum, G. N. Ruhberg.

Olivia—September 16 to November 11, 1929; 20 registrations; 8 lectures; cost $75.00. Lecturers: Drs. J. F. Fulton, A. H. Beard, C. N. Hensel, E. T. Herrmann, C. B. Wright, Rood Taylor, E. C. Robitshek, S. R. Maxeiner.

Houston-Fillmore County Society—September 27 to October 24, 1929; 12 registrations; 3 lectures; cost $35.00. Lecturers: Drs. E. G. Bannick, H. I. Lillie, J. M. Hayes.

Marshall—October 1 to November 5, 1929; 25 registrations; 6 lectures; cost $135.00. Lecturers: Drs. J. M. Hayes, W. A. Jones, Z. Giffin, Moses Barron, O. H. Wangensteen, H. E. Michelson.

Hibbing—October 3 to November 21, 1929; 20 registrations; 7 lectures; cost $150.00. Lecturers: Drs. H. E. Michelson, E. M. Hammes, A. F. Bratrud, F. J. Hirschboeck, B. F. Davis, J. R. Manley, O. W. Rowe.

Mankato—October 10 to December 19, 1929; 25 registrations; 10 lectures; cost $160.00. Lecturers: Drs. F. C. Rodda, W. C. Alvarez, A. R. Barnes, P. S. Hench, Horace Newhart, C. N. Hensel, N. M. Keith, A. M. Snell, B. S. Gardner, L. A. Buie.

St. Cloud—December 12, 1929, to March 6, 1930; 20 registrations; 12 lectures; cost $96.00. Lecturers: Drs. C. N. Hensel, R. C. Logefiel; W. A. Fansler, R. T. LaVake, Fred Pratt, H. O. Altnow, E. A. Loomis, H. E. Michelson, W. E. Camp, G. R. Dunn, Moses Barron. (Dr. Altnow gave three different lectures in the series.)

Hibbing—April 3 to May 8, 1930; 17 registrations; 6 lectures; cost $160.00. Lecturers: Drs. F. J. Hirschboeck, Franklin R. Wright, A. B. Rivers, J. R. Kuth, H. G. Irvine, W. A. Fansler.

Mankato—April 3 to June 12, 1930; 25 registrations; 10 lectures; cost $160.00. Lecturers: Drs. E. T. Evans, H. M. Connor, E. T. Herrmann, H. B. Sweetser, Jr., E. G. Bannick, T. W. Weum, E. J. Huenekens, W. H. Goeckermann, Walter Camp, and one not yet assigned for the last meeting.

Marshall—April 8 to May 27, 1930; 18 registrations; 8 lectures; cost $185.00. Lecturers: Drs. W. E. Patterson, P. A. O'Leary, R. T. LaVake, F. C. Rodda, C. N. Hensel, L. A. Buie, C. C. Chatterton, V. S. Counsellor.

Willmar (colloquium)—April 17 to June 5, 1930; number of registrations not known; 8 programs; cost $50.00. Cost to General Extension Division $55.00 (estimated).

Brainerd (colloquium)—April 21 to June 9, 1930; number of registrations not known; 8 programs; cost $50.00. Cost to the General Extension Division $72.00 (estimated).

Olivia—April 21 to June 9, 1930; 12 registrations; 8 lectures; cost $85.00. Lecturers: Drs. E. T. Evans, R. C. Logefiel, H. E. Michelson, R. C. Webb, F. C. Rodda, Horace Newhart, R. S. Rizer, and probably A. M. Snell.

Winona (colloquium)—April 22 to June 10, 1930; number of registrations not known; 8 programs; cost $50.00. Cost to the General Extension Division $65.00 (estimated).

Wadena (colloquium)—May 2 to June 27, 1930; number of registrations not known; 8 programs; cost $50.00. Cost to the General Extension Division $80.50 (estimated).

Faribault (colloquium)—May 5 to June 23, 1930; number of registrations not known; 8 programs; cost $50.00. Cost to the General Extension Division $80.00 (estimated).

A SERIES OF COLLOQUIUM LECTURES

Given at Wadena, Willmar, Litchfield, Faribault, Brainerd, and Winona.

A Post-Graduate Medical Short Course of unusual interest is offered to the members of the Minnesota State Medical Association. A program covering eight weeks at a total expense of only $50, payable to the University Extension Division. This course will consist of the following eight programs, two of which are selected from the regular post-graduate short course list.

Lecture No. 1—Minnesota State Medical Association Meeting

The Women's Auxiliary or your wives may attend. At least three of your state officers will be present. Your state president has promised to attend. The Chairman of the Committee on Hospitals and Medical Education, and the Councilors will be the speakers. The subjects to be discussed will be the affairs of the State Medical Society, its activities, and its relation to the practice of medicine.

Lecture No. 2—"Tuberculosis"—Under the Auspices of the Minnesota Public Health Association

The new phases of Childhood Tuberculosis and Lung Tuberculosis will be discussed and illustrated with movies and lantern slides. Speakers to be selected.

Health Meeting: Arrangements can be made with the local Parents-Teachers Association or other organizations for a Health Meeting. The speakers who appear before the medical group will also be available to speak before a lay group on health subjects. Both meetings can be in session at the same time.

Lecture No. 3—"Cancer," "Obstetrics," "Your Hospital"—Under auspices of the University Hospital and Medical College, University of Minnesota.

Lecture No. 4—Speaker and subject to be selected.

Lecture No. 5—"Heart Disease"—Under auspices of the State Medical Association, Heart Committee.

Lecture No. 6—"Immunology, Toxin Anti-Toxin," and other State and local health problems, under auspices of Minnesota Department of Health.

Lecture No. 7—Speaker and subject to be selected.

Lecture No. 8—Under the auspices of University Extension Service, to be selected from the following:

"Uniform Mental Endowment"—Dr. Herbert Sorenson.
"British and American Humor"—Dr. Herbert Eaton.
"Speech Defects"—Dr. Bryng Bryngelson.
"Art"—Mr. S. Chatwood Burton.
"Insects and Human Affairs, or The Battle with the Bugs"—Dr. Royal Chapman.

Dr. Manley: The Reference Committee recommends the adoption of this very excellent report and wishes to recommend that after the various extension lectures and colloquium courses a report be sent to the chairman of this committee by the local men informing of the success of the meeting from the standpoint of the local society.

A motion was made and carried that the report of the Committee on Hospitals and Medical Education be accepted.

Dr. Pearce (Minneapolis): I haven't very much to add to the report. I simply would say that the chairman of the committee would appreciate any criticism either good or bad from the men who are taking these courses. I might say briefly that our regular extension course plan has seemed to be increasingly in demand each year, and the work of the Consultation Bureau, of which Dr. O'Brien is the head, also seems to be growing. The new colloquium work which has been put on this spring more or less as an experiment, we do not know yet how well they are received and whether they are now put on in the best possible way. We hope, by studying the results this spring, to make changes to improve them. We will at least put on three or four this fall. This lecture series has been the means of reaching into three new districts which we would never have been able to reach with our regular extension courses. Of course, the regular courses will be carried on as usual.

Dr. Robbins (Winona): I was chairman of the committee that was asked to take on these lectures in Winona, and I took charge of the publicity part and Dr. Steiner carried on the rest of the work. We had a committee of two to carry it out, but we had very little time to prepare. I think Dr. Meyerding came down one week and the following week we started our lectures. We averaged thirty attendance of doctors. The lectures were very interesting and instructive and as a general average everybody was enthusiastic about it. We had a territory of sixty doctors to reach within forty miles of Winona, and we believed that our first attempt of getting half of them to the lectures was well worth our efforts.

President Boyer: If there is approval of this thing it is incumbent upon the delegates from the different component committees to carry home a distinct impression of this committee. This committee operates under considerable expense, as is the case with some other committees. You should express yourselves, as some way favorable or opposed to this sort of work.

Dr. Adams (Hibbing): We gave the first course last fall. One doctor came about eighty miles, and one doctor came about sixty miles, and neither missed a single meeting. We are arranging for a third course this fall, and we have found it is not only a good educational proposition but is a good feature to get the doctors together. We have no other sort of contact and this has brought us together, and we have also preceded our evening course with a supper and the fellows enjoyed it very much, and I would recommend to those who have not started it that it be done.

Dr. Manson (Worthington): We have had three courses and are so enthusiastic that we are planning another course this fall. Some of them come for forty miles, and out of a membership of about 52 we had an average attendance of 35 to 38, and we feel that from the standpoint of benefit to the doctor the benefits are two-fold—keeping up to date, and the personal contact that comes from getting together in these meetings.

President Boyer: You have heard from Dr. Manson in the southern part of the state and from Dr. Adams in the northern part of the state, telling of the advantages of this work. Are there any other remarks?

We will hear from the Reference Committee.

Dr. Manley: The Reference Committee recommends the adoption of the report of the Heart Committee. This is a very important committee and the report should be read carefully by all the delegates. We also recommend that this report be specially featured in Minnesota Medicine, and that the committee continue the excellent work which they have started.

REPORT OF THE HEART COMMITTEE

Since the last report there have been some additional developments in the Heart Committee which might be of interest to your body. In the latter part of November, 1929, a notice was received from Dr. J. A. Myers, President of the Minnesota Public Health Association, stating that the Minnesota Public Health Association had been appointed by the American Heart Association as its official representative in the state of Minnesota. It was the belief of the Minnesota Public Health Association that this affiliation was demanded because the situation in this state was becoming rather acute as far as the control of the public health campaign was concerned. A Heart Committee of the Minnesota Public Health Association was then appointed with Dr. J. A. Myers as chairman and with a total membership of nine, all physicians and two of them members of the Heart Committee of Minnesota State Medical Association, Dr. F. A. Willius and Dr. F. J. Hirschboeck.

The precedent for an affiliation with the Public Health Association has been established in certain states, notably Wisconsin, Iowa, Pennsylvania and New York. It is proposed by the Public Health Association Committee to coöperate fully with the Heart Committee of the Minnesota State Medical Association and to have the latter serve as a liaison committee with the State Medical Society and for the purpose of approach to the practitioners of the state. It is hoped that by means of this affiliation some of the funds at the present time derived from the sale of Christmas Seals may be employed in the furtherance of the campaign regarding heart disease much as it has been used in the past concerning tuberculosis.

It is the wish of the Heart Committee of the Minnesota State Medical Association that the educational work at the present time be restricted to educating the physicians of the state by means of lectures, heart symposia, colloquium courses and use of a short period in each regular program for consideration of a cardiologic subject and to do everything possible to prepare the men in practice in properly conducting heart clinics and to interest themselves in the rehabilitation of chronic cardiopaths and education on the prevention of breakdowns in later years. In order to exert influence on this movement medical men of the state must interest themselves in the broad sociologic and economic phase of the subject and prepare themselves in cardiology so that they will be able to undertake any work requested of them lest it fall into the hands either of restricted specialists as the work in tuberculosis is at the present time or into the hands of a lay body as is the situation in Ohio presently, in which the medical profession is entirely ignored.

We believe that at the present time as the Heart Committee is organized, and with a spirit of *rapport* between the State Medical Society and the Public Health Association, much can be achieved on the one hand in bringing about a higher standard in the knowledge of cardiology among the practitioners in the state and on the other hand prevent an abuse that might tend ultimately to cleave out another large segment of practice from the general practitioner.

As a result of this educational program there have been five discussions on a cardiologic subject in various sections of the state as a part of the Colloquium course sponsored by the committee of Medical Education under Dr. N. O. Pearce, namely at Wadena, Willmar, Faribault, Brainerd and Winona. The St. Louis County Medical Society devotes ten minutes of every monthly meeting to a consideration of cardiologic subjects and a circular letter written to the secretaries of the component societies of the state urging this plan has elicited a favorable response from several. It is suggested that this movement be continued and that other sections of the state take up the Colloquium course in order to foster the educational work within the profession. At the present time the Hennepin County Medical Society has a County Heart Committee which works in conjunction with the Minnesota Public Health Association in promoting occupational placement of chronic cardiopaths and in the establishment of cardiologic clinics and has prepared an excellent course on cardiology which was given at thirteen successive noon meetings of the Hennepin County Medical Society at their club rooms. It is further proposed this next year, beginning in the fall, to have a series of articles in Minnesota Medicine, permission for which has been tentatively granted by Dr. C. B. Drake, giving a serial, comprehensive outline of cardiology for educational purposes in the profession and for the standardization and classification of vital statistics on that phase of practice.

F. A. Willius — A. D. Hoidale
H. E. Richardson — D. P. Head
H J. Lloyd — F. J. Hirschboeck, *Chairman*

A motion was made and carried that the report be accepted.

President Boyer: Gentlemen, the American Heart Association some time ago took up the matter of heart study and heart education, seeking to disseminate knowledge of heart disease among the public. It becomes incumbent upon us as the profession to see that we ourselves are better informed on this matter than the public. This report should be published in Minnesota Medicine—not only that, but the report should be sent as a letter to every member of the State Society.

The Reference Committee.

Dr. Manley: The report of the Committee on State Health Relations, Dr. Sweetser, Chairman.

REPORT OF THE COMMITTEE ON STATE HEALTH RELATIONS

Up to June 1, one stated meeting was held and there were numerous informal meetings of parts of the Committee. Contact has been maintained with the State Board of Health and other tax-supported health agencies and with the Committee on Public Health Education. Various letters referred to the Committee from the State Board of Health have been cared for on the principle that the work of preventive medicine should be done as much as possible by physicians as part of the private practice of medicine, and that the conditions governing any coöperative medical work should be determined by the local county or district medical society.

Last year, at the instance of your Committee, the House of Delegates recommended that each local Medical Society set up a scale of fees for public health work. We are trying to find out the present status in that regard.

Last year the Committee supported the previous recommendation of the Committee on Public Health Education that each local society establish a public welfare committee to maintain contact with and influence the medical policies of various local health agencies. We are trying to find out which local medical societies have such committees.

The Committee has endeavored through the year to help where possible in the campaign for immunization against diphtheria.

Theodore H. Sweetser, M.D., *Chairman.*

Dr. Manley: This is one of the most important committees in the Society and they have done a great deal of work. The Reference Committee recommends the adoption of this report, and would ask the delegates if they can make any answer or report on two questions which this committee brought up last year: First, have any local medical societies set up a scale of fees for public health work? Second, has each local society a public welfare committee to maintain contact with and influence the medical policies of various public health agencies?

Motion was made and carried that the report be adopted.

Dr. Sweetser (Minneapolis): Last year, on the basis of the report of the Committee on State Health Relations, the House of Delegates recommended that each

local society (1) adopt a scale of fees for official public health work done by its members, and (2) appoint a public welfare committee to maintain contact with and influence the medical policies of the various official and unofficial local health agencies. We have recently asked the Secretaries of the local societies as to what action has been taken. Twenty out of the thirty-four Secretaries replied in each instance that nothing has been done. I hope that, when you go home, you will do your best to have some action taken, as I feel that both these matters are of importance.

The public is very much interested, as you all know, in matters of public and personal health. Requests have repeatedly been sent to the State Board of Health requesting wholesale vaccinations and diphtheria inoculations. Dr. Chesley has referred these requests to us and the people have been advised to make arrangements with their local physicians individually or through their County Medical Society. One such request gave evidence that the writer wished the State Board of Health rather than the private physician to do the work in order to get something for nothing. In another instance, however, it was evident that some coöperative work by the physicians of a District Medical Society would be necessary if the work were to be done as part of the private practice of medicine. It seems to me that everyone in the private practice of medicine must take a more active interest in community health matters if such matters are to be kept within the scope of private practice and not forced into the hands of the official and unofficial health agencies.

PRESIDENT BOYER: Is there any further discussion of the question of the work of Dr. Sweetser's committee?

The Reference Committee.

DR. MANLEY: The next is the report of the most important committee of the whole society, the Committee on Public Policy and Legislation. The chairman of this committee, Dr. Johnson, requests that he be allowed to give his report orally.

DR. JOHNSON (Dawson): We have had a great deal of trouble with national legislation this year, not that we have made so much noise about it, but there is one thing after another. You might class them under the heading of the Sheppard-Towner legislation and the narcotic bills. We have wired and written our different congressmen about these bills. We got Dr. Wright, on his way East, to go to Washington to see the Minnesota congressmen in regard to them. Under the bills introduced The Children's Bureau would have taken the control right out of the hands of the state and would have given all authority to some Laymen's Bureau in Washington, who would be absolutely independent of any medical organization, and State Board of Health, or the United States Public Health Service. If this is going to be handled at all in a national way, it should be handled through our Public Health Service at Washington. In spite of our best efforts, these paid-up lefters will probably keep at it until they get some kind of a bill through Congress.

The next thing is the narcotic bills. There have been two or three different types of them. One bill would have given absolute control to some bureau in Washington and they would have been responsible to no one. For any infraction of their regulations, they could revoke our license to practice medicine and we would have to go to Washington to fight it. This was a hard fight and a great deal of effort was spent in defeating it.

Dr. Wright introduced a resolution in the House of Delegates of the American Medical Association which provided that the Board of Trustees appoint a committee of five to study national legislation. Dr. Braasch, as a member of the committee to which this resolution was referred, did a great deal to secure for it a recommendation to pass. I appeared before the committee in behalf of the resolution and did what little I could to get it passed. It was finally enacted by the House of Delegates and such a committee will now be appointed. The Board of Trustees is very conservative, it seems to us, when it comes to expending money for national legislation. We feel that they are not spending enough money down there and that congressmen don't know everything about these bills. The committee appointed by the Board of Trustees are to report to the next House of Delegates and also to the Board of Trustees such recommendations as they think necessary. Right there in Washington is where the trouble to our profession is coming from in the way of state and social medicine, and that is where it must be fought out. Washington is filled with lobbyists, who are often financed by well-meaning, but misinformed and misguided individuals.

Next take the Veterans' bill. I don't know how many bills have been introduced, but the House of Delegates of the American Medical Association passed a resolution asking the president to veto the Veterans' bill, which he did. Even against this there was a fight in the House of Delegates as some were afraid of offending some one, but finally they came to the conclusion that if they wanted anything they would have to ask for it and fight for it if necessary. By the time we got through, I am sure they all understood what the Minnesota delegation stood for. The resolution went through in fine shape. One of the doctors in charge of an army hospital said that out of six hundred beds in the hospital, eighty-five per cent were occupied by people whose disease had no service connection. If it keeps on as it has and they want more and more Veterans' hospitals, the time will come when these veterans are not going to be hospitalized all the time and these hospitals will be empty. The government is not going to have them empty and some use will be made of them, probably in the line of state and social medicine. It surely will be an opening wedge for some form of state medicine. We are not opposed to taking care of the man who is entitled to it, but we don't believe in treating diseases with no service connection in government hospitals. It was brought up in the House of Delegates that we should work for some system in coöperation with the government, whereby instead of the government building so many hospitals that the veterans be treated in their home cities in the local hospitals, but the government would pay for the hospitalization and medical services.

Don't forget the American Medical Association, because if there ever was a need for organized medicine sticking together, it was never more necessary than it is now. I really feel that the day may come when we would be glad to pay a hundred dollars a year as dues to the American Medical Association and state associations, if by so doing we can stop the trend of things from drifting the way they are now doing.

In regard to our own state, I feel that if we continue to stay active and well-organized as we have in the past few years we can take care of things here. We likely will have problems to fight as usual at the next session. The thing to do is to be ready for them when they come, and be constantly on the job. If we aren't, they certainly will take advantage of the opportunity to pass new quack bills and to repeal legislation passed the last few years.

In closing I want to say that the efficiency of our state organization is, in a large measure, due to our far-seeing and broad-minded councilors and our active president and hard-working committees. Last, but not least, to our own active and able secretary, Dr. Meyerding. What Dr. West is to the American Medical Association, Dr. Meyerding is to our organization. We know that other organizations are offering him greater opportunities and more of a financial reward than he is getting here. We hope he will not leave us, but will stay here. It would be a hard blow to our state association if we should be deprived of his valuable services.

PRESIDENT BOYER: We will hear from Mr. Brist.

MR. BRIST (St. Paul): We have run across two or three things in this state with reference to getting after quacks. The first thing is the naturopath. I started after one in the northern part of the state some time ago, told him who I was and asked to see his Basic Science Certificate. He said he didn't have it. He was a graduate chiropractor from the school of Davenport, and couldn't get a license because he couldn't pass the examination, but belonged to the Naturopathic Society. He was supposed to pay $25.00 but they had been assessed an extra $200.00 every year for the legislature. He said, "Furthermore, I understand there is an agreement with the Medical Board that we will not be prosecuted." He gave me the man's name and I told him he had better go back to his lawyer and find out about the four we had convicted. He said, "We felt you would get tired of fighting us and grant Basic Science Certificates to those of us who were in the state." I told him the chances were very slim, as legislation along this line was very carefully watched by the medical profession and the public. I said I would come back in thirty days and if he was still there he would be arrested for practicing without a license. He said he was going back to Winnipeg.

There is another class of people in Minnesota. There are only six of them that I know of so far who call themselves napropaths. They are from a school in Chicago. One of them is under arrest in this town now. The definition means, "That branch of medicine which attributes disease and disorders to an improper condition and functioning of the ligaments and connecting tissue." Since they returned from their convention in Chicago they have taken down their signs from their doors. One has refused to do it, and the Medical Board has served notice on him to appear next week and show cause why his license should not be revoked. He said Clarence Darrow was their attorney and would take care of the case. Dr. Weiser and Dr. Adson are here to talk to you about the attitude of the Board. I feel safe in saying that the Medical Board intends to prosecute these fellows, and we have received wonderful coöperation from the Medical Association of this state. We had a fellow prosecuted in New Ulm last week for doing what we call bleeding and cupping. He charged one person $70.00 for it. He was fined $500.00.

A large number of people write to Dr. Meyerding, and we try to get right behind them and go after them. The medical profession is interested in this problem, and yet the Board cannot do much if the Legislature amends the laws so as to take the teeth out of them.

I want to assure you on behalf of the Medical Board that as long as we have your support we will prosecute the quacks of this state.

PRESIDENT BOYER: We will now hear from Dr. Weiser.

DR. WEISER (New Ulm): I think we are very fortunate in having such an aggressive supporter as Mr. Brist, and in the majority of instances we have been very successful. Mr. Brist does not prosecute these illegal practitioners without first making a very thorough investigation, so all the prosecutions have been successful.

DR. ADSON (Rochester): The Board of Examiners coöperates with us in every manner and they have been making an attempt to keep the expenses down, reasonable with the effort accomplished.

DR. MANLEY: I move the adoption of the report of Dr. Johnson.

Motion was seconded and the report adopted.

PRESIDENT BOYER: The Reference Committee.

DR. MANLEY: The report of the Committee on Medico-Legal Affairs.

REPORT OF COMMITTEE ON MEDICO-LEGAL AFFAIRS

The Committee on Medico-Legal affairs has held no definite meeting except that its members were present at the general Committee meeting held by Dr. Boyer, in Minneapolis, February 10, 1930.

It has been the belief of the Committee on Medico-Legal affairs that the time is ripe in the State of Minnesota for some constructive legislation along the lines of expert testimony, particularly with reference to the mental status of criminals being brought to trial. It has been felt desirable to have the initiation of such legislation as in the State of Massachusetts, whereby the matter of sanity of criminals is not brought before a Jury for decison, but is determined by a Commission or Board appointed for that purpose, and that the matter of the sanity of the criminal should never be left

to a lay jury to determine. In view of the fact that this involves an amendment to the Constitution of the State of Minnesota, it is impossible to make any rapid progress in the enactment of such legislation. It is felt by this Committee that such legislation should primarily be enacted through the legal profession, with the moral support of the medical profession of the State. No definite work has been done in regard to this except informal inquiries of members of the Bar Association. We cannot report progress in this matter, but merely outline what we believe to be a policy for constructive legislation in this State.

There was referred to this Committee a communication from Margaret Sanger, of New York City, requesting endorsement of a bill to be introduced in Congress to amend the penal laws concerning birth control. It is the recommendation of this Committee, by a vote of four to one, that the House of Delegates do not endorse 'this bill.

There has been in the hands of this Committee, also, for consideration, another matter relative to one member of the State Medical Association, which matter is still in the process of investigation and upon which, at this time, the Committee is not ready to make a report.

Other than this, this Committee has no activity to report.

W. H. Hengstler, M.D., *Chairman.*

PROPOSED AMENDMENTS TO SECTIONS 334 AND 396 OF TITLE 18 OF THE UNITED STATES CODE AND SECTION 135 OF TITLE 19 OF THE UNITED STATES CODE

Section 211 Penal Laws is Section 334 United States Code.

Section 245 Penal Laws is Section 396 United States Code.

Sections 311 and 312 Penal Laws are Sections 511 and 512 U. S. Code.

Section 305a Tariff Act 1922 is Section 135 of Title 19 U. S. Code.

The Provisions of this Section shall not apply

(1) to information relating to the prevention of conception published either within or without the United States by a governmental agency, medical society, medical school, medical college or medical journal, or reprinted by any individual or organization after such publication, or

(2) to information relating to the prevention of conception sent by a licensed physician, hospital or clinic to another licensed physician, hospital or clinic or to a patient, or

(3) to information regarding the names and addresses of licensed physicians, hospitals and clinics in the State of destination which give advice relating to prevention of conception, or

(4) to any article, substance, drug, medicine or thing for the prevention of conception sent from within or without the United States to a bona fide wholesale or retail dealer in medical supplies or a licensed physician, hospital or clinic, or sent by a licensed physician to a patient.

Dr. Manley: The Reference Committee recommends the adoption of this report and concurs in the recommendation of this committee that the House of Delegates do not endorse the bill sponsored by Margaret Sanger of New York City, amending the penal laws concerning birth control.

Dr. Hammes (St. Paul): The Medico-Legal Committee felt that some ways or means should be devised by which attention would be brought to the Legislature through the Bar Association in changing the laws in some way that this can be done. At the last meeting of the American Medical Association this same matter came up before the Committee on Nervous and Mental Diseases. A resolution which covered this matter was adopted, the resolution being as follows:

"RESOLVED, That the Section on Nervous and Mental Diseases hereby declares its adherence to the principles stated in the Report of the Committee on Psychiatric Jurisprudence, Section on Criminal Law and Criminology, American Bar Association, and approved by that association at its meeting held in Memphis, Tenn., Oct. 24, 1929, namely:

"1. That there be available to every criminal and juvenile court a psychiatric service to assist the court in the disposition of offenders.

"2. That no criminal be sentenced for any felony in any case in which the judge has any discretion as to the sentence until there be filed as a part of the record a psychiatric report.

"3. That there be a psychiatric service available to every penal and correctional institution.

"4. That there be a psychiatric report on every prisoner convicted of a felony before he is released.

"5. That there be established in each state a complete system of administrative transfer and parole, and that there be no decision for or against any parole or any transfer from one institution to another, without a psychiatric report.

"RESOLVED, Further, that the section recommends that the House of Delegates of the American Medical Association adopt the principles stated above and request the Board of Trustees to take such action as may be necessary to bring about the coöperation of state and county medical associations with corresponding state and local bar associations in securing, as far as possible, the adoption of these principles in practice."

I think the fourth and fifth are the most important. I want briefly to cite two cases to show the kinds of such cases. Some years ago a discharged soldier conceived the idea that I was attempting to prevent him from obtaining his compensation. His attitude was quite threatening but quite normal. One day he dropped into Red Cross headquarters and told them he was trying to get me but that I was protected by the Democratic Government and he couldn't get at me, but he could get my wife and children. He described my home; and I took it up with the Probate Court and he was, after four hours of examination, found to have delusions. If the police had handled this case he probably would have got thirty or sixty days in jail and been released.

The second case was one we had last week before Probate Court. It was this man's third robbery, and here he was simply an accomplice. He waited about

a block away from his uncle's home while the other man robbed it, and the only reason he could assign was that this man was a friend of his. This man's intelligence quotient was 61. We recommended to the court that he be sent to Faribault. If this examination had not been made he would have received thirty or sixty days or a year and been out again.

The report was adopted by a vote.

The Reference Committee will proceed.

DR. MANLEY: Report of the Committee on Schools for Laboratory Technicians, Dr. A. G. Schulze, Chairman.

REPORT OF THE COMMITTEE ON SCHOOLS FOR LABORATORY TECHNICIANS

This Committee began its investigation by sending a postal card questionnaire to each of the 44 class "A" hospitals in the State of Minnesota as well as to the various medical clinics in the State.

From the answers received we learned that training of medical technicians is being carried on in thirteen of these hospitals and clinics, which number, added to the three commercial institutions which are in existence, makes a total of sixteen places, practically all located in the Twin Cities, where the training of medical technicians is being carried on.

A second questionnaire was mailed to these sixteen institutions and a reply was received from twelve of them. An analysis of these twelve replies forms the basis of our report.

The following replied:

St. Mary's Hospital, Duluth
Minneapolis General Hospital, Minneapolis
Northwestern Hospital, Minneapolis
Swedish Hospital, Minneapolis
University Hospital, Minneapolis
Ancker Hospital, St. Paul
Charles T. Miller Hospital, St. Paul
St. Joseph's Hospital, St. Paul
St. Luke's Hospital, St. Paul
St. Paul Clinic, St. Paul
N. W. Institute of Medical Technology, Minneapolis
Physicians' Clinical Laboratory, St. Paul

The following did not reply—

Asbury Hospital, Minneapolis (does not teach technology)
St. John's Hospital, St. Paul (report received late)
Professional Service Bureau, Minneapolis (did not report)
Mayo Clinic, Rochester (does not teach technology)

Degree of Director.—In all of these institutions, with the exception of a single clinic, the director holds the degree of "Doctor of Medicine," while in the single exception stated the degree of "B.S." is held.

Length of Course.—Three of the institutions give a six months course (this is the shortest); one school offers an eight months course; two schools offer a nine months course; five schools offer a twelve months course, while the course at the University Medical School covers four years.

Entrance Requirements.—The minimum entrance requirements in nine of the schools is a high school education; in two it is high school education or degree of registered nurse; while one school requires a college graduation.

Certificates Awarded.—There is only one school that does not award a diploma or certificate of some kind at the end of the course.

Source of Teaching Material.—One of these schools being connected with a clinic it is very obvious that the teaching material and specimens for teaching purposes are obtained through the work of the members of that clinic. Nine of the schools are connected directly and physically with hospitals and the pathological specimens and resources of those hospitals are used for teaching material for the student technicians. Two of the institutions are purely commercial and are not connected directly with any hospital but claim to be supplied with teaching material from various sources. For instance, the N. W. Institute of Medical Technology claims to receive material from the U. S. Veterans' Hospital, the State Board of Health and various practicing physicians. Another institution claims to receive material from hospitals, physicians and the St. Paul Board of Health.

Further investigation reveals the fact that the U. S. Veterans' Hospital is supplying some specimens to the N. W. Institute of Medical Technology and the State Board of Health has also supplied some cultures in the past and the St. Paul City Laboratory has also coöperated to some extent with the second institution but both of these laboratories are questioning the wisdom of this association, and will no doubt discontinue it.

We doubt whether any hospitals are supplying any material to these institutions for teaching purposes.

Students, Fees and Advertising.—These twelve institutions can very readily be divided into three groups. In the first group we have the University Medical School only. It has a class of 80 students, charges $40 per quarter and the course is four years long. There is no advertising program carried on beyond that which is carried on by the General University.

In the second group of schools we have those connected with the various hospitals. The number of pupils in their classes runs from one or two, to two, four, six and eight; rather small classes. Five of these schools charge no fees at all; three charge $50 and give the books, some meals and laundry. Another school charges a fee of $100 but makes no mention of books, meals, etc. None of these schools carry on any advertising.

In the third group are the so-called commercial institutions. One of the schools included in this report has a class of fifteen students, charges $215 for a six months course and carries on an advertising program by means of letters and advertisements in the local papers. The other commercial school charges $250 for a six months course, claims to have accommodations for 104 students and carries on a remarkable advertising program by means of catalogues and follow-up letters.

Method of Teaching.—The most important part of this survey and report pertains to the actual method of instruction which is employed, but on this point it is difficult to get full detailed information.

There can be no doubt that the four year course at the University Medical School under the directorship of Dr. Wm. A. O'Brien and his corps of technician supervisors, all of whom have a degree of "B.S." or "M.S.," is a good course and that the instruction is thorough. The greatest objection to this course, as voiced by prospective students, is the long four year period.

The courses given in the various hospitals where the laboratory material is practically without limit, where the classes are small, where the instruction is carried on by personal contact and supervision on the part of whole time trained technicians, are excellent courses and quite beyond criticism. But, the classes are so small, the waiting list is so long, that the prospective student becomes discouraged and looks elsewhere.

The commercial institutions, therefore, with their advertising program and promises of excellent positions, become attractive. How plentiful is their teaching material when they are not intimately or actually connected with a hospital? How thorough is the instruction in a short six months course when the actual teaching staff of whole time trained instructors is obviously too small for the number of students enrolled? A long, imposing list of subjects taught and apparently many didactic and laboratory hours devoted to them may mean nothing when the method of instruction is considered. There is a vast difference between lectures by part time men and the constant personal and direct instruction and supervision of full time trained technicians.

It is to be regretted that here in the State of Minnesota we have no laws governing or controlling the activities of Schools of Medical Technology or other similar schools; so there is practically no limit as to what may be done and still remain within the law. The creation of such laws may well be considered by our Committee on Legislation.

However, the Registry of Technicians of the American Society of Clinical Pathologists requires the following minimum preparation and qualifications:

(a) Graduation from an accredited high school.
(b) One year of didactic work in basic sciences, including chemistry, bacteriology, physiology and pathology, together with laboratory demonstrastratic or its equivalent.
(c) Six months of actual experience in a recognized clinical research or public health laboratory.

It certainly is not unreasonable to expect all institutions teaching medical technology to have a standard of minimum requirements for graduation which will enable its graduates to register with the American Society of Clinical Pathologists.

Certainly no institution teaching medical technology can expect to have the endorsement of organized medicine that does not have at its head a director who has the title of "M.D." or whose teachers are not registered technicians; that has not sufficient physical equipment to properly carry on this work and is not actually connected with a hospital; whose course is not at least twelve months, or that is openly commercial or carries on pernicious advertising.

What should be the attitude of the various component societies of the Minnesota State Medical Association towards those of its members who lend their name and their title as instructors which do not meet with the above requirements? One county society demanded of its member that he either give up his teaching position or resign his membership.

Another School of Medical Technology, which might be classed as a commercial concern, returned its questionnaire too late to be included in the above listing, but the answers submitted are as follows:

The Director of the School has the title of "M.D." but he evidently does none of the instructing. They offer a six months course, call for high school requirements and issue a certificate when the work is completed.

Their teaching material comes from the hospital in which the school is located and from the U. S. V. Hospital. They have a class of 24 students and charge $40 per month but it is plain that all the teaching is done by one technician.

They also offer a two months course in X-ray technic, physiotherapy and basal metabolism for $125, accommodating 15 students, but here again all this teaching is done by a single instructor who has prepared himself along these lines.

This school is contemplating substantial improvement by the middle of July.

Dr. Manley: This is a very excellent report and the committee has investigated most of the technology schools in Minnesota. There are many things in this report that demand careful consideration.

The Reference Committee recommends that the report be referred to the Council, with particular reference, first, to any new legislation, and, second, to discipline the members of the Society who lend their names to sub-standard schools, and, third, the appointment of a local member of the National Registry of Technicians to the State Committee.

We recommend the acceptance of this report, and feel that the committee should be continued.

Dr. Schulze (St. Paul): I regret very much that the questionnaires the committee sent out were not received in time so this report could go to the hands of the delegates. There are one or two important parts of this report. One of these schools being connected with a clinic, it is very obvious that the teaching material and specimens for teaching purposes are obtained through the work of the members of that clinic. Nine of the schools are connected directly and physically with hospitals and the pathological specimens and resources of those hospitals are used for teaching material for the student technicians. Two of the institutions are purely commercial and are not connected directly with any hospital but claim to be supplied with teaching material from various sources. For instance, the Northwest Institute of Medical Technology claims to receive material from the United States Veterans' Hospital, the

State Board of Health and various practicing physicians. Another institution claims to receive material from hospitals, physicians and the St. Paul Board of Health.

Upon a vote the report was adopted.

Dr. Manley: I move that this matter be referred to the Council for further study.

This motion was seconded and carried.

President Boyer: The Reference Committee.

Dr. Manley: Report of the Committee on Public Health Nursing, Dr. C. B. Wright, Chairman.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH NURSING

This Committee has had six meetings, November 29, December 5, December 18, December 30, 1929, and January 23, and June 4, 1930.

At these meetings were the Chairman, one or two other members of the Committee, also the Director of the Public Health Nurses, University of Minnesota; Director of Visiting Nurses of Minneapolis, Superintendent of Public Health Nursing, State Department of Health; a physician active in public health work, a rural nurse and lay member of a rural nursing committee. These meetings grew out of a conversation which your Chairman had with Miss Fox, representing the National Public Health Nursing organization, and later with Miss Olivia Peterson of the Division of Child Hygiene, University of Minnesota.

There are in Minnesota public nurses employed by, and responsible to, various agencies such as Child and Maternal Hygiene Nurses, School Nurses, Tuberculosis Nurses, Red Cross Nurses and County Nurses, who are employed by local school boards, Red Cross, county commissioners, State Board of Health, and these nurses are working, in many instances, with entirely inadequate supervision. It was felt that some mechanism should be instituted for better medical supervision of their work and to have certain rules and regulations drawn up that nurses may follow in emergencies until proper medical assistance can be secured.

Consequently, a set of emergency rules and regulations were drawn up and have the indorsement of this Committee. A copy of these rules will be sent to every member of the House of Delegates for their consideration and correction, and, if satisfactory, for their approval. It was also recommended that a medical advisory group be organized, consisting of members of the State Medical Association outside of the three larger cities, to advise with the state nursing organizations and it is also recommended that a similar committee be appointed from each county society, outside of the three larger cities, to act as a Medical Advisory Board to nurses working in their respective districts.

Respectfully submitted by the Committee on Public Health Nursing,

Dr. W. H. Condit
Dr. J. T. Christison
Dr. George Earl
Dr. C. B. Wright, *Chairman*

SUGGESTED POLICIES AND STANDING ORDERS FOR PUBLIC HEALTH NURSES

We have in Minnesota many nurses doing various types of public health work, some of whom are working with mothers and babies; others in schools; some in communities whose chief interest is in the control of some particular disease, such as tuberculosis; still others have developed programs to fit some particular health need.

These nurses are employed by various agencies, such as local school boards, county commissioners, Red Cross chapters, etc. The machinery for medical supervision is available in the Nursing Advisory Committee, as the law specifies that a doctor should be a member of this committee. In many instances, however, this has not provided satisfactory medical supervision for public health nursing services. Nurses also make monthly reports to the Superintendent of Public Health Nursing in the State Department of Health, and may receive upon request advisory service from the same source.

A committee from the State Medical Association, appointed by the President of the Councillors, is working with a committee, appointed by the State Organization for Public Health Nursing, comprised of the Director of the Public Health Nursing Course, University of Minnesota; the Director, Minneapolis Visiting Nurse Association; the Superintendent of Public Health Nursing, State Department of Health; a physician active in public health work; a rural nurse; and a lay member of a rural nursing committee. This committee feels an effort should be made to have more medical supervision of health programs as carried on in these local communities, and to have certain rules and regulations drawn up which the nurses may follow in the various types of work in which they are engaged.

After several meetings of this committee, some suggestive general rules and standing orders have been drawn up governing public health nursing. These are presented for your consideration.

1. Any agency employing public health nurses shall have its program approved by the local organized medical group.

2. Nursing care should be continued, after the first visit, only under the direction of a licensed physician.

3. The nurse shall not recommend the selection of any individual physician. Free medical care found necessary after careful consideration of economic condition of patient may be provided for either through a volunteer service of local physicians or through the use of facilities provided by the state and municipality with the approval of the family physician.

4. The nurse does not diagnose nor prescribe treatment. It is, however, her function to carry out the doctor's instructions. The local medical group should approve minimum routine standing orders (see list attached). Records of such nursing care should be kept on file by the nurse.

5. The establishment of clinics or other events which involve medical service should be undertaken only after consultation with the medical societies or local physicians.

6. Every public health nurse should understand and support regulations of the local and state health departments and shall keep in direct contact with their personnel.

7. Every nurse engaged in public health nursing should be eligible for certification in Minnesota as provided by law. See Sec. 4, Chapter 196—S.F. 495.

8. The work of every nursing agency should be carefully and consistently recorded and the nurse should give a report periodically to the person or group responsible for the service and to the State Department of Health as provided by law. See Sec. 5, Chapter 196—S.F. 495. (It is recommended that these reports be given publicity.)

STANDING ORDERS

Standing orders are those orders for treatment and medication which can be used until a physician can be secured or when orders have not been left by the attending physician. The following are examples of standing orders frequently used:

New Patients.—General or partial care as the situation indicates. Instruct family in hygiene of the sick room and care of the patient until next visit. Explain continuance of nursing care depends upon attendance of physician.

Elevated Temperature.—Put patient to bed. Urge importance of quiet and rest. General isolation routine if communicable disease is suspected. Liquid diet. Plenty of water. Sponge for temperature of 102 to 105. If patient is suffering from abdominal pain, family should be instructed to give nothing by mouth, until patient has been seen by the physician.

For Infants and Children with Fever, Undiagnosed.—Normal salt flushing when required. Diet: Boiled water for twenty-four hours.

Sore Throats and Colds.—Isolation. Plenty of water. Liquid diet. Urge medical attention.

For Discharging Ears.—Cleanse the outer ear with moist boric solution swabs. Dry thoroughly. Do not irrigate. Emphasize need of prompt medical attention.

Ulcers (Chronic).—Cleanse with normal salt or boric solution. Apply hot dressings of either solution and a firm bandage.

For Dressing, Minor.—Cuts, bruises, infected fingers, scratches. Apply mercurochrome, alcohol or tincture of iodine followed by alcohol direct to wound or abrasion. Cover with gauze or clean handkerchief. Advise medical observation in every case.

Emergencies and Accidents.—Communicate with physician. First aid treatment until medical aid is secured. If patient is a minor, communicate with parent immediately if possible.

Burns.—Always consider burns as serious injuries. Remove clothing, if possible, and if area of burn is extensive, remove patient to hospital as soon as possible. For first aid, if there is severe pain, apply vaseline, sweet oil, normal salt solution, or boric acid solution and advise calling physician.

Prenatal Cases.—Aim to bring patient under the care of her physician at once. Acquaint patient with the educational literature obtainable from the State Department of Health. Take temperature, pulse, respiration. If possible, bring a specimen of urine in to her physician unless this has been done recently or will be done soon by the patient. If the patient is to have a home delivery, help make up the necessary sterile supplies as advised by the Division of Child Hygiene in literature distributed by them. Call as often as needed to help the patient with her diet or any treatment ordered by the attending physician.

Obstetrical Cases.—For the mother, cleansing bath. Change pads. Perineal irrigation with ½% of lysol solution. Leave in warm, dry bed. For baby, oil and bathe. Sterile cord dressing. Keep warm. Every nurse is charged with the responsibility of being concerned with the protection of the eyes and the registration of the birth as provided for in the state law.

Post-Partum Hemorrhage.—Send someone else for physician immediately. Elevate foot of bed. Put patient in elevated Sims position. Keep patient quiet and warm. *No hot drinks.*

Puerperal Mother.—Cleansing bath. Local cleansing with antiseptic solution. Sterile dressing to breasts and vulva. Urge patient to go to physician for post-partum examination.

Nurses engaged in school nursing will often see abnormal skin conditions, inflamed eyes and symptoms which suggest the onset of communicable disease. Where it is difficult to get a doctor to assume responsibility, it is recommended that instructions be included in the standing orders indicating what the nurse is to do in these matters.

It is recommended that instructions endorsed by the Medical Association listing the symptoms which call for the exclusion of children from school and setting forth the procedure to be followed by the nurse in notifying the family, the family physician, etc. Such instructions, of course, must agree with the local and state laws and ordinances.

DR. MANLEY: This committee has drawn up rules governing the conduct of the various classes of public health nurses, and the Reference Committee believes that the House of Delegates should lend its support to these rules and to the work in general. We recommend that these rules be taken up before local societies and modified to meet local conditions.

We recommend the acceptance of this report.

Upon motion and vote the above report was accepted.

DR. MANLEY: Report of the Committee on Contract Practice, Dr. Webb, Chairman.

REPORT OF THE COMMITTEE ON CONTRACT PRACTICE

The Committee on Contract Practice held one meeting this year at the time of the general meeting held at the Leamington Hotel.

In last year's report it was stated that the Committee felt that the situation as to Contract Practice was satisfactory to all concerned and it was the sense of the Committee that it should confine its activities to consideration of complaints on Contract Practice as brought to its attention during the year.

As nothing further has been brought to the atten-

tion of this Committee, we have nothing further to report at this meeting.

It has been suggested that the name of the Committee be changed to Committee on Traumatic Surgery and Contract Practice.

R. C. Webb, M.D., *Chairman.*

Dr. Manley: Since there are no reasons for a change in name given in the report, the Reference Committee recommends the retention of the old name "Committee on Contract Practice," and asks for a full discussion of this matter by the House of Delegates, with two particularly important points in mind. First, the matter of efficient service to the patient, and, second, the matter of the development of an adequate and more or less uniform rate of compensation for the physician, bearing in mind the fact that some localities might advantageously have a different rate of compensation from another.

The Reference Committee recommends acceptance of this report, and feels that while a complete solution of this problem is very difficult, an attempt should be made to solve some of the more urgent problems.

Upon motion and vote the report was accepted.

President Boyer: The Reference Committee desires a discussion on the two points involved, the quality of service rendered and the compensation received. Dr. Collins, can you tell us about this?

Dr. Collins (Duluth): Our committee has only had one meeting, as far as I know, and I wasn't present at that meeting. However, there is a very brief report that has been handed in which represents all the deliberations I am familiar with. There is very little we can do with regard to contract practice. There has been some discussion as to whether we should change our name to Committee on Traumatic Surgery.

Dr. Manley: The report of the Committee on University Relations, Dr. S. H. Boyer, Chairman.

REPORT OF UNIVERSITY RELATIONS COMMITTEE

There has been no meeting of this committee thus far this year. There has been but one matter brought to the attention of the committee up to date. This is in relation to the distribution of radon seeds to the medical profession by the University of Minnesota.

It appears that a considerable number of doctors have desired to avail themselves of the use of radium emanations and, laboring under the impression that they could obtain emanations from the University, have learned upon request that they were mistaken. After discussing this subject by mail with members of the University Relations Committee, it was decided to ask Dean Lyon for an explanation. The dean replied, after he had made an investigation, that the amount of radon seeds available is not sufficient to permit of a uniform supply to the doctors of the State and that, therefore, no arrangements had been made with them. He explains further that occasionally a little is left over, but not regularly. The shortage of seeds upon the part of the University is due to the possession of a comparatively small amount of radium. It is hoped that the University will be able to find ways and means whereby it can increase its supply.

It is interesting to note that the only place in the United States from which radon seed may be obtained is the Standard Radium Corporation of America with offices in New York City. At one time this corporation maintained a branch office in Chicago, since closed. The Standard Radium Corporation of America represents the merging of all other concerns in this country which were in the radium business.

Very truly yours,

S. H. Boyer, M.D., *Chairman.*

President Boyer: When the radium plant was established at the University of Minnesota the feeling on the part of the profession was that the Minnesota profession would be able to receive radium emanations from that source. It was later given out by the head of the department that there were no radium emanations to spare, and because of this fact no arrangements had been made with the doctors of the state to supply them. He stated further that occasionally a little is left over, but not regularly, and that the shortage of seeds on their part is due to the possession of a comparatively small amount of radium. We hope the University will be able to find a way to increase its supply.

At the present time the Standard Radium Corporation of America with offices in New York controls the entire situation, and if you want any of these seeds you must obtain them from this company. I don't know what further can be done about it.

Upon a vote a motion to accept the report was carried.

Dr. Manley: Report of the Committee on Military Affairs.

REPORT OF THE COMMITTEE ON MILITARY AFFAIRS

Resolution to be presented to the House of Delegates of the Minnesota State Medical Association by the Committee on Military Affairs:

WHEREAS, The present Army regulations require that every reserve officer shall, during each five years commission period, put in two hundred (200) hours military work, in camp, correspondence school, in active training meetings, or similar military activity, or else become ineligible for renewal of his commission with assignment to an Organized Reserve Unit, and therefore revert to the "Auxiliary Reserve" in time of peace, and

WHEREAS, There are many highly trained, highly skilled and very active physicians who, as reserve officers, have been assigned as chiefs and assistant chiefs of surgical, medical, laboratory, roentgen and other distinctly professional services in Organized Reserve Hospital Units, carrying very little administrative responsibility, and whose professional duties in busy private lives make them especially well fitted for their duties in their army assignments, but whose same duties make it practically impossible for them to carry on military work in time of peace, and

WHEREAS, Many of these men and their valuable attainments are being lost to the Organized Reserve,

although they are willing and anxious to serve in time of need and do not aspire to advancement in grade,

THEREFORE, be it resolved, that the Minnesota State Medical Association, desiring that the Medical Profession may be of the greatest service to our country, respectfully suggests that the service might be enhanced if the regulations were changed to provide for recommission and reassignment of chiefs and assistant chiefs of professional services of Hospital Units even though they have not completed the required amount of military work, and further,

Be it resolved, That a copy of this resolution be sent to the Surgeon and the Commanding General of the Seventh Corps Area, The Surgeon General, the Officer in charge of Reserve Affairs, the Adjutant General and The Chief of Staff of the United States Army.

RALPH T. KNIGHT, M.D., *Chairman.*

DR. MANLEY: The Reference Committee recommends the adoption of this report.

The report is voted upon and approved.

PRESIDENT BOYER: There are some communications to be acted upon at this time.

DR. MANLEY: This is a communication from the Inter-State Post-Graduate Medical Association of North America, officially inviting this Society to attend their meeting in Minneapolis October 20th to 24th. I move that the Secretary acknowledge the invitation with thanks.

This motion was carried.

DR. MANLEY: This is a communication from the Minnesota Department of Health relative to their work in connection with maternal mortality.

MINNESOTA DEPARTMENT OF HEALTH

To the House of Delegates,
Minnesota State Medical Association:

As reported in the letter of June 30 to your Secretary and to your President, the study of the maternal mortality conditions in Minnesota undertaken by the Division of Child Hygiene of the State Department of Health in coöperation with the Federal Children's Bureau is sponsored by this body. The results of the investigations carried on in Minnesota are now in the hands of the statisticians of the Children's Bureau. Owing to the press of work of statistical material demanded by the White House Conference they have been delayed in completing this maternal mortality study. It will, however, be available sometime within the next few months. In the meantime, this very brief statement regarding the Minnesota maternal deaths may be made:

MATERNAL DEATH RATES

Year	*Minneapolis*	*St. Paul*	*Duluth*	*State*
1928.....	5.63	6.61	8.22	5.25
1929.....	4.40	4.46	4.16	4.27

In addition we wish to mention at this time the extremely coöperative and helpful manner in which the physicians throughout the state received the representative of the Board who carried on this study. The doctors' records were always placed at his disposal and such additional information as either the doctor or the hospital could furnish was always made available to our representative. We feel that this helpful and coöperative spirit in connection with this study is perhaps a conspicuous factor in explaining why Minnesota stands so high in the matter of its maternal and also of its infant mortality rates.

DR. MANLEY: The Reference Committee commends the work being done by the Minnesota Health Department and believes that during the course of years statistics will be available which will be of great practical value.

I move the acceptance of the communication.

Motion was seconded and carried.

DR. MANLEY: This is a new resolution, of which the delegates have not had a copy, presented by the Hennepin County Medical Society. The following resolution was adopted at a meeting of the Executive Committee of the Hennepin County Medical Society on February 28, 1930, and was passed by the Society. The Executive Committee recommends that the delegates of the Hennepin County Medical Society be instructed to present the following resolution:

"That a committee of five be appointed by the President to make a careful study of the policies of the State Medical Association, particularly along the lines of the consideration of the problems and development of the County Societies, of redistricting of the Association, accumulation of reserve fund, the organization of permanent committees and changes in the personnel or the duties of the executive officers, and to make such recommendations as they deem advisable for the best interests of the Association and the component Societies."

The recommendations to be presented at the House of Delegates at the 1931 meeting.

The Reference Committee has approved this resolution, and I move its adoption.

DR. SAVAGE (St. Paul): It seems to me that this matter should first go before the Council rather than be referred to the House of Delegates. The Council is probably more familiar than any similar number of men with the various problems which confront the State Medical Association, and of course the function of this committee is the job of the Council. I don't think there is any objection at all to a study being made of the activities of the State Association, but I do feel that this report should be submitted to the Council for their opinion.

PRESIDENT BOYER: Will you submit that as an amendment to the original motion?

DR. SAVAGE: I offer that as an amendment.

DR. MANLEY: I accept it.

The motion was then voted upon and carried.

PRESIDENT BOYER: Applications have been received from the following for associate membership in the Association: Thomas G. Lee, Minneapolis; John F. Noble, St. Paul; Donald Smelzer, Philadelphia.

Motion was made, seconded and carried that the above mentioned applications be approved.

DR. MANLEY: This is a resolution presented by the Hennepin County Medical Society having to do with the recognition of Dr. Farr's work. This resolution

was presented before the Minneapolis Surgical Society on March 6, 1930. It is as follows:

"The recent enthusiasm over various forms of anesthesia other than those in use fifteen or twenty years ago make it evident that anesthesia of that time was not all that could be desired. Recent information has taught us beyond doubt that our surgical mortality has been reduced by the introduction of some of the newer types of anesthesia.

"By his untiring efforts, patience and persistence, Dr. Robert Emmett Farr, a member of this organization, has perhaps done more than any other man to bring about the widespread dissatisfaction with the general use of the old form of anesthesia.

"By his skillful administration of local anesthesia and his extensive writings and demonstrations thereon, he has convinced the medical profession that at least in certain types of surgery lives can be saved by substituting this method for those generally accepted by surgeons of the past.

"Therefore, be it resolved, that because of his contribution to surgery, his service to mankind, his part in the preserving of human lives, Robert Emmett Farr, one of our esteemed members, be recommended by the Minnesota State Medical Association to the committee as a recipient of the next annual Nobel Prize."

The Reference Committee recommends the adoption of this resolution.

The resolution was voted upon and adopted.

DR. MEYERDING: The following is a petition received from resident physicians of Dakota County:

"We, the undersigned physicians, residents of Dakota County, hereby petition the House of Delegates to grant a charter to the Dakota County Medical Society.

G. F. WALTER, Farmington,
T. J. GAFFNEY, Lakeville,
J. A. SANFORD, Farmington,
W. T. HAGERTY, Cannon Falls,
L. D. PECK, Hastings,
H. A. FASBENDER, Hastings,
L. R. PECK, Hastings."

DR. SAVAGE: I move that the House of Delegates recommend the granting of a charter to the Dakota County Medical Society.

This motion was seconded and carried.

DR. MEYERDING: Here is a petition presented by the Camp Release District Medical Society:

"Will the House of Delegates request the different committees to have their reports in at a definite time and mailed to the different societies; the idea being to get action from the component organizations in time to take it to the annual meetings?"

The Secretary endorses this communication from the Camp Release District Medical Society. The Secretary's office mails this material as soon as possible to those authorized to see it, as they can testify. It was necessary to send three different sets of material to the delegates when one should have been sufficient.

This recommendation was approved.

PRESIDENT BOYER: Is there any new business to come before this meeting?

DR. MEYERDING: I would like to announce that the Council will meet here twenty minutes after adjournment of this meeting.

PRESIDENT BOYER: We will meet here tomorrow at 2:00 P. M.

Motion was made, seconded and carried that the meeting adjourn.

The meeting adjourned at five-fifteen o'clock.

SECOND MEETING OF THE HOUSE OF DELEGATES

The second meeting of the House of Delegates, held in the English Room of the Duluth Hotel, Duluth Minnesota, in conjunction with the Sixty-second Annual Session of the Minnesota State Medical Association, July 14-16, 1930, convened at two-ten o'clock, July 15, Dr. S. H. Boyer, President, presiding.

PRESIDENT BOYER: Gentlemen, come to order, please. We will have the roll call.

Secretary Meyerding called the roll.

PRESIDENT BOYER: All those whose names have not been called, stand.

PRESIDENT BOYER: Supplementary report of the Credentials Committee.

SECRETARY MEYERDING: Are you ready, Dr. Boleyn, with your Credentials Committee report?

DR. E. S. BOLEYN: Fifty-six.

PRESIDENT BOYER: Summary of the minutes of the preceding meeting.

Secretary Meyerding read the minutes.

PRESIDENT BOYER: You have heard the report, gentlemen. Are there any corrections?

DR. ALBERT G. SCHULZE (St. Paul): On the report of Dr. Manley's Reference Committee on the report of the Historical Committee no mention was made of changing the date of the organization, 1853.

SECRETARY MEYERDING: That is just a synopsis. That will be in the regular minutes. The reporter made a very brief synopsis.

DR. S. H. BAXTER (Minneapolis): This may be in the nature of new business, but it relates to one of these reports. That is the report of the Committee on Military Affairs in which the Committee made certain recommendations or suggestions to the surgeon-general, and it has been suggested to me that it might be of some weight if this resolution or something similar to it would be presented and passed by other state medical associations. Therefore, I would like to move that the Secretary communicate this report and recommendations to other societies with the idea that the combined influence might have some effect in having these suggestions put into effect.

The motion was seconded and carried.

PRESIDENT BOYER: Are there any further corrections or remarks? What will you do with the minutes?

DR. F. J. SAVAGE (St. Paul): I move their adoption.

DR. ALBERT G. SCHULZE (St. Paul): I second it.

PRESIDENT BOYER: If there is no objection the report will stand as read.

Next is the report of the Council.

Dr. H. M. Workman, Tracy, read the report of the Council.

SECOND MEETING OF THE COUNCIL

The second meeting of the Council was held on Monday, July 14, 1930, at the Hotel Duluth. The meet-

ing convened immediately after the House of Delegates' meeting.

The following were present: H. M. Workman, W. H. Condit, G. S. Wattam, F. J. Savage, F. A. Dodge, W. A. Coventry, L. Sogge, W. W. Will, M. S. Henderson, E. A. Meyerding.

Motion made by Dr. Sogge seconded and carried that the minutes of the last meeting be approved as written.

Motion made by Dr. Savage, seconded and carried that the Committee on Schools for Laboratory Technicians be continued and that it endeavor to establish a standard whereby schools may be classified.

It was suggested that the President of the Council read to the House of Delegates letters from the Parents-Teachers Association and the opinion of the Attorney General regarding pre-school examinations.

It was recommended that the chairman of the Board of Medical Examiners be made a member of the Committee on Hospitals and Medical Education.

The meeting adjourned.

Secretary Meyerding: You will recall the Council appointed the President of the Committee to confer with the President of the Parents-Teachers Association relative to the summer round-up, and this is the President's letter of March 12 to Mrs. A. H. Mendenhall, President Minnesota Congress of Parents and Teachers, and her reply.

March 12, 1930.

Mrs. A. A. Mendenhall, President,
Minnesota State Parent-Teachers Association,
1528 Jefferson Street,
Duluth, Minnesota.

In re: Summer Round-up of Children of Pre-school Age.

Dear Mrs. Mendenhall:

Answering the request of the Parent-Teachers Association for endorsement of the above mentioned movement by the Minnesota State Medical Society:

First: The Minnesota State Medical Society is in sympathy with anything tending to promote either public or private health or both.

Second: We are not in favor of health examinations *en masse*, inasmuch as we believe this method to be wasteful of time, inefficient in process and therefore faulty in its final diagnostic conclusions and advice as to treatment.

Third: We believe that physicians lending their aid to this activity should render thoroughly good service and receive commensurate compensation for their work.

Fourth: It is our belief that, in the prosecution of this work, the parents and guardians of children about to enter school should be encouraged to have their children examined by physicians of their own choice (preferably their family physician) and at their own expense. The children of those who for any reason are unable to meet their financial obligations should be examined by one or another of the free agencies.

Fifth: We recognize that in some few localities, owing entirely to local conditions, the examination must be conducted at public expense.

Taking the above provisions into consideration and believing that your association will not be unmindful of them in carrying on your work, the Minnesota State Medical Association whole-heartedly endorses the movement and assures you of its genuine coöperation.

Very respectfully yours,
S. H. Boyer, M.D., *President.*

Minnesota Congress of Parents and Teachers
State Headquarters
200 City Hall, Duluth, Minnesota
March 12, 1930

Dr. S. H. Boyer, President,
State Medical Association,
Duluth, Minn.

My dear Dr. Boyer:

Thank you very much for your fine letter containing not only the endorsement of your association but good advice for better procedure.

I have sent the letter to the editor of our state magazine asking that all of the letter be published so that your position may not be misunderstood nor misrepresented. Your letter will be read at the next meeting of our state board and I am sure will be very much appreciated.

Sincerely yours,
Mrs. Austin Mendenhall, *President.*

Secretary Meyerding read communications relative to the examination of children of pre-school age.

The Board of Education of the City of Duluth
Duluth, Minnesota.
May 1, 1930

Dr. S. H. Boyer, President,
Minnesota State Medical Association,
Lyceum Building,
Duluth, Minnesota.

Dear Dr. Boyer:

In connection with the examination of children of pre-school age, you may be interested in knowing that the office of the Attorney General has expressed the opinion that there is "no statutory authority which permits the use of the public funds of a school district for the medical or physical examination of children who are not attending the public schools," and that in reply to an inquiry made by the Commissioner of Education, as to whether it was lawful for a Board of Education to expend public money for medical or physical examination of children not attending the public schools, the reply was in the negative.

The opinion was issued April 28.

Very truly yours,
J. M. Robinson.

Dr. C. L. Haney (Duluth): We put that through the regular channels, through the school district of Duluth, through the Commissioner of Education, and through the Atorney-General's office. We knew pretty well beforehand we were going to get this opinion. After the P. T. A. reached the Attorney-General's office Mr. Phillips, the Assistant Attorney-General, practically reversed the decision, so the opinion reads now, I understand, that school children who are to enter school this fall can be examined. That is practically a reversal of the Attorney-General's opinion. That leaves it wide open. You can examine those who are entering school this fall. When we had this first opinion of course we had it all tied up.

President Boyer: You have heard the report, gentlemen. Are there any remarks or any discussion at all? What will you do with the report?

Dr. Albert G. Schulze (St. Paul): I move it be accepted.

Dr. J. R. Manley (Duluth): I second it.

President Boyer: If there is no objection, it will so stand.

The next order of business is the election of officers. Are there any nominations for the office of President?

Dr. O. E. Locken (Crookston): Mr. President and Members of the House of Delegates: In the past few years this Association has taken on a very intensive program of legislative and educational activities, and in order to carry on that work they have found it advisable to select the man for the office of president from the group of men who have been most active in doing that work, and that has been a very wise policy. Because of the many activities of the organization it has been nccessary to have someone who is not only a man of distinction in our Association but also a man who really knows the problems and purposes of the Association. From time to time the Association has gone outside of the two large cities and Rochester to select some member of our Association from the rural sections.

Today we feel that that is a wise policy to follow. It has now been five years since the Association has selected such a man. I am very happy to have the privilege today to make the nomination of that very likeable gentleman and honorable member of our Association, Dr. L. Sogge of Windom, a man who I am sure we can say has a multitude of friends and not a single enemy. I nominate Dr. L. Sogge of Windom. (Applause.)

Dr. R. C. Farrish (Sherburn): I take very great plcasure in seconding the motion.

Dr. N. O. Pearce (Minneapilis): In the name of Hennepin County delegation, from one of the large cities of the organization, it gives me great pleasure to second the nomination of Dr. Sogge.

President Boyer: Are there any other nominations?

Dr. F. H. Magney (Duluth): I move the nominations be closed.

The motion was seconded.

President Boyer: I don't think that should be rushed in a hurry. Are there any other nominations?

Dr. G. S. Wattam (Warren): I move that the Secretary be instructed to cast the ballot of this House of Delegates for Dr. Sogge of Windom as our next President.

President Boyer: Apparently there were no other nominations. Therefore, the motion is in order.

The motion was seconded and carried.

Secretary Meyerding: I hereby cast the unanimous ballot for L. Sogge as President for the ensuing year. (Applause.)

President Boyer: I appoint Dr. Locken and Dr. Wattam as a committee of two to escort Dr. Sogge into this chamber.

The next order is that of nominations for First Vice President.

Dr. W. W. Will (Bertha): A few years ago I was privileged to nominate a Vice President. This man was elected and proved to this Association that a Vice President can be of value to an association. That man later becamc the President of the Association and proved to be one of the greatest prcsidents this Association has ever had. I am not taking any credit for the man who was selected. I have in mind now a man for Vice President who I believe can render in cither office a like service, a man who has been untiring in his efforts in behalf of this Association.

Inasmuch as we have just elected a President from the country, and inasmuch as probably the next year's meeting will be in Minneapolis, it seems wise that we should select a Vice President from the city of Minneapolis. With that in mind, I have great pleasure in presenting the name of William H. Condit of Minneapolis for First Vice President. (Applause.)

Dr. Albert G. Schulze (St. Paul): I second it.

Dr. W. A. Fansler (Minneapolis): As delegate from Minneapolis I wish to second the nomination and say that the delegates from Minneapolis will be very happy to have Dr. Condit as our First Vice President, and feel it is an honor to Dr. Condit and to the Hennepin County Medical Society if he is elected.

President Boyer: Are there any other nominations.

Dr. W. F. Maertz (New Prague): I make a motion that the Secretary cast the unanimous ballot of the House.

The motion was seconded and carried.

Secretary Meyerding: I hereby cast the unanimous ballot for Dr. Condit as First Vice President.

President Boyer: Next in order is the Second Vice President. Nominations are in order. We have to have a Second Vice President, gentlemen. Does anybody want the job?

The audience arose and applauded as Dr. Sogge came forward.

President Boyer: It is hardly necessary to introduce the new President-Elect, but I shall call upon him to express himself as he sees best.

President-Elect Sogge: Gentlemen, I wish I were in possession of words that could in a slight degree express my appreciation of an act of this kind. Sunday night when I got in here somebody approached me and suggested that I serve as President for the coming year. I told him it was absolutely impossible; I could not fill that placc. In the first place I did not deserve the honor and further I was not capable. This man told me that I was in the hands of my friends and that they had done considerable work along that line and I could not refuse. I feel, folks, that if I am to take this job I want to feel that I am in the hands of my friends and they have got to help me. I feel, with the competent Secretary that we have, we may get along, and the work will undoubtedly be done by him. I thank you from the bottom of my heart for the honor. I appreciate the honor, but I also realize the responsibility. Thank you. (Applause.)

President Boyer: I wish to assure Dr. Sogge that judging by past performances of the members of this Association and its officers, he will not lack for support in his efforts to continue the success of this Society.

The Second Vice President is still begging for an office.

Dr. F. J. Savage (St. Paul): I would like to place the name of Owen Parker of Ely in nomination for Second Vice President.

Dr. G. S. Wattam (Warren): I second it.

PRESIDENT BOYER: Are there any other nominations? If not, we will proceed to cast the ballot.

The motion was carried.

PRESIDENT BOYER: Next is Secretary. Do you want a new Secretary? (Laughter.) Please make a motion, somebody.

DR. C. L. SCOFIELD (Benson): I move that the nominations be closed (laughter), and that the President be instructed to cast the vote of the Society for Dr. Meyerding.

PRESIDENT BOYER: Are there any objections?

DR. H. M. WORKMAN (Tracy): I should like to say, Mr. President, that this is a great chance to economize. If we start in with a new Secretary he can do it with a good deal less money. (Laughter.) I will second the nomination. (Laughter.)

PRESIDENT BOYER: The ballot is hereby cast for Dr. Meyerding. (Applause.)

Would you like to talk, Dr. Meyerding?

Next in order is the election of a Treasurer.

DR. H. J. ROTHSCHILD (St. Paul): I take great pleasure in nominating Dr. A. G. Schulze to succeed himself as Treasurer of this Association for the ensuing year.

DR. C. P. ROBBINS (Winona): I move the Secretary cast the ballot.

PRESIDENT BOYER: It has been moved and seconded that the Secretary cast the ballot for Dr. A. G. Schulze as Treasurer.

The motion was carried.

SECRETARY MEYERDING: I hereby cast the ballot for A. G. Schulze as Treasurer. (Applause.)

PRESIDENT BOYER: We must proceed with the election of Councilors. Four are to be elected. There will be a vacancy shortly in the Fourth District. That vacancy must be filled. The present incumbent is Dr. F. A. Dodge of Le Sueur.

DR. M. S. HENDERSON (Rochester): Mr. Chairman and Members of the House of Delegates: Brother Dodge has been a member of this Council for twenty-eight years, and everybody in the Association has known him and respected him, and he now says he has had enough, and I think his wishes must be respected as much as we would like to have him serve in office. I would like to suggest the name of a man who has been active in all organized medicine and stands high in the profession, Dr. Holbrook of Mankato.

DR. W. F. MAERTZ (New Prague): I second the nomination.

PRESIDENT BOYER: Any other nominations?

DR. E. M. HAMMES (St. Paul): I move nominations be closed.

The motion was seconded and carried.

DR. W. C. PORTMANN (Jackson): I move the Secretary cast the ballot.

DR. G. S. WATTAM (Warren): I second the motion.

PRESIDENT BOYER: If there are no objections he is so instructed.

SECRETARY MEYERDING: I hereby cast the ballot for Dr. Holbrook as Councilor of the Fourth District.

PRESIDENT BOYER: We will now proceed to the Sixth District. The present incumbent is Dr. Condit of Minneapolis. He is now First Vice President, leaving a vacancy in the Sixth District. These are all officers-elect, because it is the first of the year that the change takes place.

DR. W. P. GREENE (Minneapolis): We have a man in Minneapolis who has very well proven himself as far as taking interest in the work of the State Association and particularly the local association is concerned. He is a man who is untiring in his efforts in promoting medical matters in the state and he has proven himself to be a live wire in every respect. I take great pleasure in nominating Dr. N. O. Pearce to succeed Dr. Condit.

DR. E. S. BOLEYN (Stillwater): I second the motion.

PRESIDENT BOYER: Are there any other nominations?

DR. H. M. WORKMAN (Tracy): I move that nominations be closed and the Secretary be instructed to cast the ballot.

The motion was seconded and carried.

SECRETARY MEYERDING: I hereby cast the ballot for Dr. N. O. Pearce of Hennepin County as Councilor of the Sixth District.

PRESIDENT BOYER: Dr. Pearce is duly elected. The Eighth District. G. S. Wattam is the present incumbent.

DR. A. D. HASKELL (Alexandria): It gives me great pleasure to offer the name of the present incumbent, Dr. Wattam of Warren, Minnesota.

DR. G. S. WATTAM (Warren): Mr. President, I deeply appreciate the fact that the delegate from my Councilor District has again placed me in nomination as Councilor. I have had great pleasure in serving with the present members of the Council for the past six years. It has been a pleasant duty for me but I feel that my age and the location that I have in my district make it very inadvisable at this time that I accept that nomination, and with the consent of the delegate, and no rebuttal, I would like to place in nomination a man whom you all know and who will serve you to better advantage than I can or have. I place in nomination Dr. Hagen of Moorhead.

DR. A. D. HASKELL (Alexandria): It has been the custom for us to abide by our Councilors' decisions. I will withdraw my motion.

DR. G. S. WATTAM (Warren): I would like to place in nomination Dr. O. J. Hagen of Moorhead.

PRESIDENT BOYER: It has been moved and seconded that O. J. Hagen be elected as Councilor of the Eighth District. Are there any other nominations?

It was moved, seconded and carried that the Secretary cast the ballot.

SECRETARY MEYERDING: I hereby cast the ballot for O. J. Hagen of Moorhead as Councilor of the Eighth District.

PRESIDENT BOYER: Dr. Hagen is duly elected.

Dr. Sogge has been a member of the Council for a good many years. His term would normally expire in 1933. His unexpired term must be filled.

DR. E. S. BOLEYN (Stillwater): I nominate William A. Piper of Mountain Lake.

The motion was seconded.

PRESIDENT BOYER: Are there any other nominations?

It was moved and seconded and carried that the Secretary cast the ballot.

SECRETARY MEYERDING: I hereby cast the ballot for Wm. A. Piper of Mountain Lake as Councilor of the Second District to fill the unexpired term of Dr. Sogge.

PRESIDENT BOYER: It is customary for the Council to present to the House of Delegates the names, or nominees for delegates to the House of Delegates in the American Medical Association. The names the Council have submitted are those of Dr. H. M. Johnson and Dr. W. F. Braasch. They will be elected for a period of two years providing the nominations of the Council meet with the approval of this body. This body is at liberty to make additional nominations if it be so inclined. What is your pleasure?

DR. E. S. BOLEYN (Stillwater): I move that the nominations of the Council be accepted.

DR. J. R. MANLEY (Duluth): I second it.

The motion was carried.

PRESIDENT BOYER: Two names for alternates were submitted by the Council, Dr. B. S. Adams and Dr. O. J. Hagen. Dr. Hagen has been elected to the Council. Therefore he will not be able to serve as an alternate delegate to the American Medical Association.

DR. W. F. BRAASCH (Rochester): In view of the fact that Dr. Hagen is a Councilor, there is no legal objection to it, and while he is unquestionably a very good man for this position, I wonder if it wouldn't be good policy, possibly, to spread the office around a bit. Therefore, in view of Dr. Hagen's name I would like to nominate Dr. W. L. Burnap as alternate. He already has had considerable experience in that field.

DR. G. S. WATTAM (Warren): I second the motion.

PRESIDENT BOYER: Are there any other nominations?

The motion was carried.

PRESIDENT BOYER: Dr. Burnap is then one of the candidates for the position of alternate. The two names standing for election are Drs. Adams and Burnap. What will you do with these nominations?

DR. W. A. COVENTRY (Duluth): Mr. President, I move that the Secretary be instructed to cast the ballot of the House of Delegates for Dr. Johnson and Dr. Braasch as delegates and Dr. Adams and Dr. Burnap as alternate delegates to the American Medical Association.

The motion was seconded and carried.

SECRETARY MEYERDING: I hereby cast the unanimous ballot of delegates to the American Medical Association and alternates as follows: H. M. Johnson and W. F. Braasch as delegates, and B. S. Adams and W. L. Burnap as alternates.

DR. J. R. MANLEY (Duluth): There has been one more new resolution submitted to the Reference Committee.

Dr. Manley read the resolution.

RESOLUTION

The Washington County Medical Society in regular monthly meeting, April 13, 1930, voted unanimously that the Secretary of this Society should draw up a resolution in regard to certain matters specified in said Resolution and present same to the President of the Minnesota Medical Association. The Resolution of said Society follows:

Be it resolved, that, whereas, numerous interests are constantly requesting or demanding from the regular medical profession free service, for example, general physical examinations and toxin-antitoxin administration to pre-school children, service the profession should be paid for, inasmuch as said service is of distinct benefit to whom rendered; and further, that such requests or demands are by this Society regarded as wedges toward state medicine; therefore, be it resolved, that this Society does request the Minnesota State Medical Association to take some steps or action toward uniform and fair basis for a satisfactory solution of these or similar questions now before us or coming up in the future. It is understood that this Society is in accord with the whole regular medical profession, that any attention will be cheerfully rendered, free of charge, in case of inability to pay. It is further resolved that these different agencies should be informed when requesting any free service that the regular medical profession does more real charity work than any other class. Be it further resolved that a copy of this Resolution be forwarded to Samuel H. Boyer, M.D., President of the Minnesota State Medical Association. Adopted at Stillwater, Minnesota, May 13, 1930.

WASHINGTON COUNTY MEDICAL SOCIETY
WADE R. HUMPHREY, M.D., *President*
E. SYDNEY BOLEYN, M.D., *Secretary.*

DR. MANLEY: The Committee recommends the acceptance of the resolution.

PRESIDENT BOYER: You have heard the resolution. The Committee recommends the acceptance thereof.

DR. MANLEY: I move that.

DR. G. S. WATTAM (Warren): I second the motion.

PRESIDENT BOYER: Is there any discussion? An expression of opinion really ought to be had on that, even though there be no dissenting opinion.

DR. E. S. BOLEYN (Stillwater): It was felt that we would like to have uniform action by the whole Society as to how we should deal with these different examinations. Some people have been trying to get this and that for nothing and notably the Parents-Teachers Association have been trying to get a meeting and place the matter before us. We have had two meetings. We have lost two programs because they didn't come. They first intimated if we didn't do that they would appoint somebody to do it. Next they wanted us to appoint one or two men from the Society to do these examinations. We have objected to that because experience at large seems to be that men appointed to do those examinations at schools have demanded they be done at schools. That is not the way to do it. The best way to do it is to have a family physician make the examinations and do them in the office so as to take sufficient time to give them the proper service they are entitled to. We would like to have the Society appoint a Committee to draw up some sort of a program for the examination and that it be accepted and that the school boards could give these blanks to the children, or the parents before the schools are opened, and they could go to the family physician and be examined, and those who come up for examination be notified it would be advisable to have their children examined. We also made a ruling that those who

could pay would be charged $5 for each child, and that those who could not pay would receive the service free.

PRESIDENT BOYER: Any further discussion?

The motion was carried.

PRESIDENT BOYER: The recommendations of Dr. Boleyn can be referred and will be referred to the Public Health Education Committee, which Committee we think can handle that very satisfactorily.

SECRETARY MEYERDING: Yesterday an amendment to the By-laws was submitted which reads as follows: "Resolved that Chapter IX, Section 1, be amended by striking out the words 'A committee on Necrology' and that the duties of this committee be transferred to duties of the Historical Committee."

DR. H. M. WORKMAN (Tracy): I move the adoption of that.

The motion was seconded and carried.

PRESIDENT BOYER: Have you any unfinished business?

DR. H. M. CONNER (Rochester): In twenty-eight years as Councilor, the case of Dr. Dodge should be recognized by the Society by a vote of thanks. I therefore move that this Society extend a vote of thanks to Dr. Dodge for his services these twenty-eight years.

The motion was seconded and the audience arose and applauded.

PRESIDENT BOYER: Next is time and place of the next meeting. Where are we going to meet next year?

DR. N. O. PEARCE (Minneapolis): In behalf of the Hennepin County Medical Association and the people of Minneapolis I want to offer an invitation for this organization to meet in Minneapolis for their next annual meeting. (Applause.)

The motion was seconded and carried.

PRESIDENT BOYER: The time of meeting had better be left to the decision of the Council, because they might have to change the time. They can't tell just when is the best time. Will someone make a motion as to the time?

DR. W. A. COVENTRY (Duluth): I move the time of the next annual meeting be left to the discretion of the Council.

The motion was seconded and carried.

PRESIDENT BOYER: A Committee is to be appointed to present the President-Elect at installation Wednesday morning at ten a. m. The Committee that escorted him in will be appointed to perform that function, Dr. Locken and Dr. Wattam.

A motion is in order to present resolutions of thanks to the St. Louis County Medical Society, Hotel Duluth, Duluth Chamber of Commerce, Duluth Tribune, and Duluth Herald. You can appoint the Secretary to do that if you wish. If there is no objection we will so act.

DR. G. S. WATTAM (Warren): I would so move.

PRESIDENT BOYER: It is all settled.

DR. C. P. ROBBINS (Winona): I offer this resolution to the House of Delegates: That the delegates meet a day before the regular convention so that the delegates can enjoy the program of the convention.

The motion was seconded.

SECRETARY MEYERDING: I would like to call to your attention to the By-Laws: "The House of Delegates shall meet at two p. m. on the first day of the annual session." I suppose we could start our annual session with the House of Delegates meeting, couldn't we? I don't know how to interpret that. I think if you are going to change it you should make it to meet in the morning so that we can get through with it in one day.

The By-laws and Constitution provide: "The House of Delegates will meet at two p. m. on the first day of the annual session. It may adjourn from time to time as may be necessary to complete its business provided the hours conflict as little as possible with the general meetings. The order of business shall be arranged as a separate section of the program."

We have to meet two different days. "The election of officers shall be the first order of business of the House of Delegates after the reading of the minutes at the second meeting of the House of Delegates." It doesn't say the day after. They can meet in the morning or the afternoon.

DR. H. M. WORKMAN (Tracy): I think the trouble comes right here. The House of Delegates used to meet on the first day, then there were two days of scientific work, but a year or so ago we conceived the idea we wanted three days' scientific work. Dr. Robbins' suggestion means that we have to have a four-day session. The Council has already met twice.

DR. C. P. ROBBINS (Winona): Is it possible that the annual session can begin with the House of Delegates? I don't see why the House of Delegates can't meet a day before the regular scientific program.

DR. S. H. BAXTER (Minneapolis): I move you refer this resolution to the Council to discuss the feasibility of it and iron out the conflicts if there are any and arrange the program that way if possible, and leave it to their discretion.

PRESIDENT BOYER: Do you accept that as an amendment, Dr. Robbins?

DR. ROBBINS: I do.

The motion was seconded and carried.

PRESIDENT BOYER: Any other new business?

DR. W. F. BRAASCH (Rochester): I am sure we all are unanimous in feeling that the members of the St. Louis County Medical Society have fairly outdone themselves in the matter of hospitality, entertainment for the members, not alone the House of Delegates but our entire Association. I move that we express our appreciation of the efforts by a rising vote of thanks.

The audience arose and applauded.

SECRETARY MEYERDING: The Council will meet in this room immediately after the adjournment of the House of Delegates.

PRESIDENT BOYER: Is there any other new business? If not, a motion to adjourn is in order.

On motion regularly made, seconded and carried, the House of Delegates adjourned at three o'clock.

SCIENTIFIC PROGRAM

The scientific program was presented as published in the July number of MINNESOTA MEDICINE with the following omissions and additions.

Dr. Morris Fishbein, editor of the A. M. A. Journal, followed the other speakers at the Medical Economics meeting Monday evening.

Dr. W. J. Mayo spoke extemporaneously on the Diagnosis of Cancer of the Rectum in place of Dr. A. C. Strachauer, who was unable to be present.

The paper on Extra-Uterine Pregnancy by Dr. J. C. Masson, was read by Dr. W. N. Graves, the author having been unable to attend.

Professor Lorenz Boehler presented an additional moving picture demonstration portraying treatment of Fracture of the Os Calcis on Tuesday afternoon.

Dr. R. E. Farr being unable to attend the meeting, his paper on Local Anesthesia was read by Dr. W. N. Graves.

Following the Installation of Officers Wednesday morning, Dr. O. W. Parker presented the following report of the Committee appointed to award the gold medal offered by the Southern Minnesota Medical Association for the best scientific exhibit:

The Committee on Scientific Exhibit Award, having thoroughly studied all the exhibits from the standpoint of originality, practicability and manner of presentation, recommends that the Southern Minnesota Medical Association Medal for the best scientific exhibit at the annual meeting of the State Medical Association held at Duluth in 1930, be awarded to Dr. Leo G. Rigler of Minneapolis and his associates, for their demonstration of "Roentgen Studies of Free and Encapsulated Pleural Effusions," and that honorable mention be given to Dr. G. K. Wharton of Rochester, for his excellent and original work and beautiful slides and drawings of the blood supply of the pancreas with special reference to the blood supply of the Islands of Langerhans.

The Committee further commends the Southern Minnesota Medical Association for the gift of this medal, as it will be a definite stimulus for the development of original research work by the members of our Association.

Arnold Anderson
B. J. Clausen
T. G. Clement
F. J. Hirschboeck
O. W. Parker
E. M. Hammes, *Chairman.*

Dr. Leo G. Rigler was then presented with the medal by Dr. Parker.

The papers presented will for the most part be published in succeeding numbers of Minnesota Medicine.

THE EFFECT OF RADIANT ENERGY ON SKIN TEMPERATURE

The Public Health Service in conducting studies relating to industrial hygiene has recently completed a report dealing with the effect of radiant energy on skin temperature. This report describes the instruments that were devised and employed in these studies to determine radiant energy and skin temperature. A general picture of the results obtained has also been given as an indication or sample of the relationship between skin temperature, radiant energy, and the atmospheric conditions among steel workers. The final comparisons have been left to a later monograph which will show what correlations may appear between conditions found and the sickness rates, primarily pneumonia.

The following points have come out rather clearly in this preliminary analysis:

1. Intense sources of radiant energy had a pronounced effect on the skin temperatures of workers exposed to them; the forehead and cheeks showed the greatest increase.
2. Great differences in the skin temperatures of different parts of the body, for a single individual, were found in workers exposed to radiant energy.
3. Even under relatively cold atmospheric conditions, not far above the freezing point, high skin temperatures were encountered in workers exposed to radiant energy.
4. For workers not exposed to radiant energy there was a definite relation between atmospheric conditions and skin temperatures, both for arduous and for moderate work; the skin temperatures increasing with increase of effective temperature.

MEDICAL SERVICE IN FEDERAL PRISONS

On May 13, 1930, the President approved an Act of Congress which authorized the United States Public Health Service to provide medical service in Federal penal and correctional institutions under the Department of Justice. Henceforth the medical and psychiatric work in Federal prisons will be supervised and furnished by personnel of that Service. This new legislation is considered important in the field of penology and mental hygiene, and is part of the program for improving the conditions in Federal prisons, and also an effort to promote uniformity in the medical work of the Federal Government.

It is obvious that important medical problems arise in connection with the detailed care of Federal prisoners and that the medical service of a modern prison involves certain routine procedure and also certain research activities, the latter relating directly to the solution of medical administrative problems and to increasing the sum of knowledge concerning technical medical questions. The routine requirements of a prison medical service involve the psychiatric examination and classification of prisoners and the treatment and supervision of all mentally diseased inmates. It also involves the conduct of physical examinations sufficient in scope to permit of the prompt recognition and correction of physical defects and diseases. All the necessary facilities for reasonably meeting these requirements are largely technical or administrative medical questions.

The psychiatric examination and classification of inmates is of very great value to those concerned with the application of disciplinary measures; with the protection of the mentally disordered inmate; with the protection of other inmates and employees; with the treatment of prisoners generally; with the transfer of mentally disordered persons to institutions most suited to give specialized care; and with the subject of parole and discharge of inmates. A more intimate knowledge of the mental characteristics of prisoners should contribute to a better understanding of several features involved in correctional systems generally; to the necessity for specialized methods in care and procedure; and to the evolution of institutional facilities to meet requirements applicable to specific types of cases. Such a program will intimately dovetail with other activities of the prison, having for their object individual care, supervision, and disposition of inmates.

It is obvious that the inmates of prisons are subject to the same intercurrent physical and mental illnesses, diseases, or defects, as are seen among those that comprise the general population. A properly organized prison medical service, therefore, must be both general and special in character to meet these needs.

A well-organized medical service in a modern prison can contribute to the welfare of inmates and employees in ways other than those mentioned, by rendering advice and counsel respecting sanitation and personal hygiene; by helping to organize and guide recreational, educational, occupational, and vocational activities with a view to promoting the health of both inmates and employees; and by giving assistance and advice for maintaining a wholesome and well-balanced dietary.

It is obvious that the chief medical officer of a large modern prison has an important and specialized duty to perform, and one requiring special training, administrative ability, tact, and judgment, and that adequate assistance is necessary for him to meet the demands of a well-balanced medical service.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

EXAMINATION REPORT, APRIL, 1930

CANDIDATES BY EXAMINATION

Name	School and Date of Graduation	Address
Auld, Irving	Northwestern, M.D., 1929	317 E. 5th St., Duluth, Minn.
Brown, Robert Whitcomb	Harvard, M.D., 1928	Mayo Clinic, Rochester, Minn.
Burkley, George Gregory	U. of Pittsburgh, M.D., 1928	Mayo Clinic, Rochester, Minn.
Caldwell, John Mars, Jr.	U. of Georgia, M.D., 1928	Mayo Clinic, Rochester, Minn.
Carlson, Hjalmar Edwin	U. of Minn., M.B., 1929	1038 Matilda St., St. Paul, Minn.
Castleton, Kenneth Bitner	U. of Pa., M.D., 1927	Mayo Clinic, Rochester, Minn.
Chor, Herman	U. of Maryland, M.D., 1928	Mayo Clinic, Rochester, Minn.
Espersen, R. Wayne	U. of Minn., M.B., 1929	251 Drake Road, Bend, Oregon
Grimes, Allen Evans, Jr.	Northwestern, M.D., 1928	Mayo Clinic, Rochester, Minn.
Happe, Lawrence John	Creighton, M.D., 1929	Marshall, Minn.
Herbert, Willis Leo	Creighton, M.D., 1929	Maynard, Minn.
Herbst, Kenneth Albert	U. of Minn., M.B., 1929	Hastings, Minn.
Holmstrom, Carle H.	U. of Minn., M.B., 1929	St. Mary's Hosp., Duluth, Minn.
Humphrey, Arthur Allan	Northwestern, M.D., 1929	Mayo Clinic, Rochester, Minn.
Johanson, Waldemar G.	U. of Minn., M.B., 1930	627 E. Jessamine St., St. Paul, Minn.
Johnson, Arthur Bernhoff	U. of Minn., M.B., 1930	3606 Dupont Ave. N., Minneapolis, Minn.
Johnson, Herbert Paul	U. of Minn., M.B., 1929	1604 Elliot Ave., Minneapolis, Minn.
Jordan, Lewis Stanley	Eclectic Med. Coll., M.D., 1926 Cincinnati, Ohio	Riverside San., Granite Falls, Minn.
Jorris, Edwin Hall	U. of Minn., M.B., 1929	St. Mary's Hosp., Duluth, Minn.
Knapp, Miland Elbert	U. of Minn., M.B., and M.D., 1929	1538 Hillside Ave. N., Minneapolis, Minn.
Knight, Homer Holcomb	U. of Minn., M.B., 1929	General Hospital, Minneapolis, Minn.
Loucks, Milo M.	U. of Minn., M.B., and M.D., 1930	Pipestone, Minn.
Lynch, Francis W.	U. of Minn., M.B., 1929	University Hosp., Minneapolis, Minn.
McLane, Evelyn Gruhlke	Rush, M.D., 1930	Sleepy Eye, Minn.
Mark, Hilbert	U. of Minn., M.B., 1929; M.D., 1930	Akeley, Minn.
Messick, Joseph Marion	U. of Pa., M.D., 1928	Mayo Clinic, Rochester, Minn.
Murray, Robert Anthony	U. of Minn., M.B., 1929	St. Mary's Hosp., Duluth, Minn.
Olson, Clifford A.	U. of Minn., M.B., 1930	Swedish Hospital, Minneapolis, Minn.
Palmer, Bascom Willcox	Med. Coll. of South Carolina, M.D., 1928	Miller Clinic, Hamm Bldg., St. Paul, Minn.
Rademacher, Clyde J.	U. of Minn., M.B., 1929	Kimball, Minn.
Rice, Herbert R.	U. of Minn., M.B., 1929	3136 2nd Ave. S., Minneapolis, Minn.
Russell, Sidney Benteen	U. of Minn., M.B., 1929	St. Mary's Hosp., Minneapolis, Minn.
Ryan, Joseph Maurice	St. Louis U. Sch. of Med., M.D., 1929	St. Paul Clinic, St. Paul, Minn.
Sharp, Jay Emerson	Ohio State U., M.D., 1925	302 Furlow Apt., Rochester, Minn.
Smisek, Elmer Albert	U. of Minn., M.B., 1929; M.D., 1930	957 Arcade St., St. Paul, Minn.
Spooner, Alexander Dwight	U. of Wis., M.D., 1928	Mayo Clinic, Rochester, Minn.
Stenberg, Sherman T.	U. of Minn., M.B., 1929	2228 Seabury Ave., Minneapolis, Minn.
Swedenburg, Paul A.	U. of Minn., M.B., 1930	901 E. River Road, Minneapolis, Minn.
Tavenner, John Lyle	Northwestern, M.B., 1929	Waseca, Minn.
Taylor, James E. C.	Ohio State U., M.D., 1928	610 8th Ave. S. W., Rochester, Minn.
Vogel, Howard A.	U. of Minn., M.B., 1930	New Ulm, Minn.
Wahlberg, Elmer Waldor	U. of Minn., M.B., 1929	Isle, Minn.

CANDIDATES BY RECIPROCITY

Dierkes, Gustave J.	Creighton, M.D., 1917	Rollingstone, Minn.
Harmeier, John Watson	U. of Pittsburgh, M.D., 1928	Mayo Clinic, Rochester, Minn.
Hewitt, Edith Swartwout	George Washington Univ. Med. Sch., M.D., 1924	Mayo Clinic, Rochester, Minn.
Mork, Frank Edward	Creighton, M.D., 1929	803 Washington Ave. S., Minneapolis
Ruffin, Wilcox	U. of Va., M.D., 1926	Mayo Clinic, Rochester, Minn.

CANDIDATES NATIONAL BOARD CERTIFICATION

Hazen, S. Frank	U. of Pa., M.D., 1925	Mayo Clinic, Rochester, Minn.
Patmos, Martin	U. of Mich., M.D., 1928	Mayo Clinic, Rochester, Minn.

EXAMINATION REPORT, JUNE, 1930

Benjamin, Edwin Grimshaw	U. of Minn., M.B., 1930	1727 Med. Arts Bldg., Minneapolis, Minn.
Bennett, Richard Jacques, Jr.	Temple Univ., M.D., 1927	Ancker Hospital, St. Paul, Minn.
Borgerson, Murly Angus	U. of Minn., M.B., 1930	N. P. B. A. Hospital, 1515 Charles St., St. Paul, Minn.
Carlson, Leonard Telford	U. of Minn., M.B., 1930	510 Oliver Ave. N., Minneapolis, Minn.

Name	School and Date of Graduation	Address
Conlin, Leo James	U. of Minn., M.B., 1930	St. Mary's Hospital, St. Louis, Mo.
Crossland, Paul Marion	U. of Minn., M.B., 1930	329 Union St. S.E., Minneapolis, Minn.
Dalton, Burr	U. of Minn., M.B., 1930	312 Harvard St., S.E., Minneapolis, Minn.
DeCourcy, Donald Michael	Marquette, M.D., 1930	717 Conway St., St. Paul, Minn.
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THE USE OF TANNIC ACID IN BURNS OF CHILDREN*

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THE profound metabolic disturbance following a severe cutaneous burn has been the subject of extensive laboratory and clinical investigation. Theories have been offered that the reaction of the body to a thermal insult is due to a disturbance of one or another of the various functions of the skin, namely, respiration, excretion, sensation, or heat regulation. Others have attempted to explain the phenomenon observed on the basis of alteration in the blood, such as destruction of red cells by heat, concentration of the blood, inability to take up oxygen, stasis in the large vessels, and extensive thrombosis. The clinical course which follows such injuries cannot be attributed to interference with any of the functions of the skin, nor can it be ascribed to the known changes in the blood. These may be contributing factors, but in themselves they do not adequately explain the sequence of events which take place.

TOXEMIA THEORY

There is certain convincing evidence that suggests the formation at the site of the burn of a toxic substance, the absorption of which is responsible for the constitutional reaction. Reiss succeeded in isolating from the urine of burned patients a substance which was toxic to animals. Vogt observed that when parabiosis was established between two animals and one was burned, the other showed evidence of toxemia. Pfeiffer isolated cleavage products of protein decomposition from burned skin which were toxic. Robertson and Boyd have also demonstrated the toxicity of the products of protein autolysis of burned tissue. They further showed that the toxin circulated in the blood. Bardeen observed degenerative changes in the liver, spleen, kidneys, and bone marrow in a series of lethal cases. He further noted a general edema of all lymphoid tissue, which was most marked at the germinal centers. He concluded that the findings were best explained on the basis of an acute toxemia. Weiskotten and Olbrycht arrived at the same conclusion, but emphasized the degenerative changes in the adrenals. Of the various theories presented, therefore, that which attributes the constitutional reaction to absorption of some toxic substance or substances from the burned area is more strongly supported by the available evidence.

These facts suggest that the rational manner of combating the toxemia would be some form of local treatment which would prevent absorption from the site of the burn. Debridement has deserved a certain amount of popularity, but its application is limited by the severity of the procedure. Douglas attempted to retard the process of absorption by the use of the vaso-constrictor—adrenalin. Others have attempted to lessen the toxemia by the use of continuous tubs, hoping to remove the toxic material as promptly as it is formed. These methods have been efficacious to a certain degree, but have not altered the toxemia materially.

TANNIC ACID

It would seem that the rate of absorption might also be greatly lessened, if the tissue devitalized by the burn were exposed to a protein precipitant which would hold the decomposition products out of solution. Tannic acid accomplishes this purpose in forming more or less stable compounds with the burned tissue, which are relatively insoluble and are held upon the surface

*From the Department of Surgery of the Children's Hospital of Michigan, Detroit, Michigan. Presented before the annual meeting, Minnesota State Medical Association, Duluth, July 16, 1930.

instead of being absorbed into the general circulation. The precipitated proteins on the surface treated provide a protective coating against chemical, bacterial, and mechanical action as well as against sensory stimulation (Figs. 1 and 2).



Fig. 1. Case 1. Showing an extensive second and third degree burn of a child aged three years. The parchment-like covering is insensitive. Maintenance of dryness minimizes infection.

ETIOLOGY

The importance of the problem of burns in children is evidenced by the fact that 45 per cent of the lethal burns occurring annually in the United States, are in children under six years of age. In 62 per cent of the cases admitted to the Children's Hospital of Michigan during the past three years, the burn was due to someone leaving a pail of hot water unprotected (Figs. 3, 4, and 5), the filling of a bathtub with hot water, and the child falling into it, or due to a child pulling a kettle of hot water, soup or coffee from a stove, spilling the contents over itself (Figs. 6 and 7). This suggests that over 60 per cent of the mortality and morbidity of burns in children is definitely avoidable, and due to the negligence or carelessness of someone in leaving a pail of water unprotected or filling a bathtub with very hot water and waiting for it to cool, instead of drawing it at the desired temperature, or permitting a child to play around a stove on which something is cooking.

The second important causative factor is playing with matches or around a bonfire. Twenty-five per cent of our cases were of this origin.

Although boys and girls are similarly dressed during the first three years of life, more boys die of burns than girls. This may probably be attributed to the more venturesome spirit of boys which exposes them to greater danger. Statistics of the Metropolitan Life Insurance Company, covering a period of over twenty years, show that in the fourth year of life the relatively higher death rate of females from burns begins. The margin increases from five to nine years, when more than twice as many girls as boys die from this cause. This may probably be attributed to the type of clothing worn, because at all ages the morbidity is greater in boys.



Fig. 2. Case 1. Healing complete seven weeks after the injury. Pinch grafts were applied to upper chest. Thigh shows area from which grafts were cut.

PROGNOSIS

Several important papers have recently been published giving statistical data about the change in mortality from burns in children since the adoption of the tannic acid method. Harris has reduced the mortality from 26.6 per cent to 12 per

cent at the Sick Children's Hospital of Toronto. Herzfield has reduced the mortality at the Royal Edinburgh Hospital for Sick Children from 38 per cent to 9 per cent. Beckman has reported of death in all lethal cases before and after the introduction of the method now used, rather than from a study of the gross mortality percentages. This plan has been adopted.



Fig. 3. Case 2. Showing the characteristic lesion resulting from a child backing into an unprotected pail of hot water. These burns are generally of the second degree unless infection destroys the small islands of epithelium.



Fig. 4. Case 2. Healing complete three weeks after the accident.



Fig. 5. Case 3. Showing a third degree burn resulting from backing into a pail of water. This area was grafted in the presence of infection and the wound was not dressed for six days. A satisfactory take is shown.



Fig. 6. Case 4. Showing a second degree burn resulting from pulling a kettle from the stove. Child aged eighteen months.



Fig. 7. Case 4. Showing final result, four weeks later.

a reduction of the mortality at Bellevue Hospital from 27.8 per cent to 14.9 per cent. Because of the great variation in the severity of burns admitted from year to year, it would seem that a better index of the progress made would be obtained by the study of the time and cause

The prognosis in any given case of a burn in childhood must be guarded because of the profound metabolic upset which may occur. It has been stated that an adult may tolerate a burn involving one-third of the total body area and a child will tolerate one involving only one-seventh

of the total cutaneous area. It has further been stated that in regard to prognosis the extent is of more importance than the depth of the burn. This statement is true for immediate mortality,





Fig. 8 *(upper)*. Case 5. Showing a very extensive third degree burn of a child aged six years. Bands about four inches in width were grafted in stages starting on the chest and working downward. Finally each flank was grafted. Sufficient grafts were obtained from legs.

Fig. 9 *(lower)*. Case 5. Showing final result 103 days after the accident. Illustration reproduced from the 1929 Detroit Proceedings of the Inter-State Postgraduate Medical Association of North America.

but it is certainly not true for ultimate mortality in children.

The depth of a burn is determined by the temperature of the agent and the duration of the contact with the skin. It is well established that thick skin, as on the palms of the hands, offers a greater resistance to heat than the softer, more delicate skin of the protected parts of the body. The same applies to children, where the skin of the entire body is thinner, of softer texture, and more delicate than that over corresponding parts of the adult body. Accordingly, an intensity of heat applied to the skin of a child for a given increment of time may cause a third degree burn, while the same thermal stimulus on the thicker, more resistant skin of an adult may cause only a first or at most a second degree burn. For this reason, large, deep burns are seen frequently in children from what appeared to be a relatively slight thermal trauma. This may leave a large granulating wound which is very badly tolerated early in life, and is of grave prognostic significance (Figs. 8 and 9). Unless prompt epithelization is accomplished by skin grafting the picture of exhaustion develops and various complications occur. In the adult this problem does not arise, because the granulating wound is well tolerated and grafting is a simple procedure which may be done under local anesthesia. In children, the matter is a serious one because delay means the development of complications, while the risk of the procedure and its attending anesthesia is considerable.

Wilson has divided the clinical course of severe burns into four stages, which are descriptive of the underlying pathology at any given time, and are exceedingly helpful in arranging a rational therapy: (1) Shock; (2) acute toxemia; (3) septic toxemia; (4) healing.

SHOCK

When a child receives a burn of any great extent, shock almost invariably occurs. It is exceedingly difficult to state when shock ends and the true toxemia of burns begins. The skin becomes cold and clammy, the temperature falls, the pulse becomes rapid and weak, and sensibility is blunted. Cannon has presented a rather plausible theory of shock and concluded that it is due to the absorption of autolyzed protein from the site of the injury. Crile, on the other hand, emphasizes the stimulation of the sensory nerve endings. It would, therefore, seem reasonable to assume that any drug which would precipitate the protein devitalized by the burn and stop absorption and at the same time dull the exposed

sensory nerve endings would be effective, regardless of which theory one accepts. Tannic acid is such a drug.

Our method has been to place the child in a light tent on sterile sheets (Fig. 10). Open all blebs, carefully remove all loose tissue, and cleanse the denuded area as carefully as possible without excessive trauma. Time spent thoroughly cleansing the burn at this period minimizes subsequent infection. The burned area is then sprayed with a five per cent aqueous solution of tannic acid every fifteen minutes until the surface is a light brown color. This is generally accomplished in about two hours.

Underhill has shown that marked concentration of blood occurs and that if this is allowed to persist it is soon incompatible with life. It is known that hyperglycemia and at times glycosuria occurs during this initial period. It has also been established that the blood chlorides are markedly depressed. Because of these facts it has been our custom to give normal saline instead of glu-

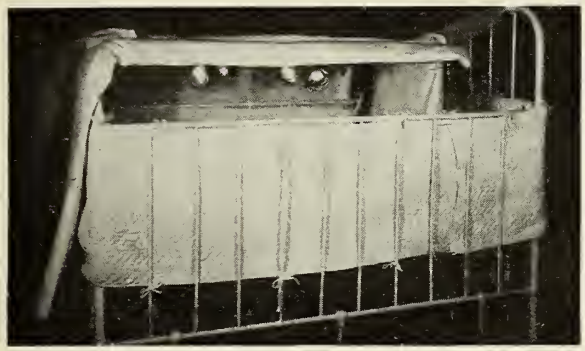


Fig. 10. Showing arrangement of bed. Sheet hung at head to protect eyes from light. Mosquito netting is shown thrown back. Lights are in position to furnish adequate heat.



Fig. 11. Case 6. Showing a second degree burn of a child three years of age. The coagulum has spontaneously separated from the buttocks, revealing complete healing.



Fig. 12. Case 7. Showing an extensive third degree burn in process of preparation for grafting. Area covered with a perforated cellulose non-adhering dressing over which compresses are placed.



Fig. 13. Case 8. Showing the wound after the area has been covered with pinch grafts. The extent of the wound into the axilla should be noted. Grafts cut from both thighs, entire back done at one stage.



Fig. 14. Case 8. Showing functional result one year later.

cose subcutaneously, intravenously, and per rectum promptly upon admission, as well as to force fluid by mouth.

It has further been demonstrated that the capillaries during this period are more permeable than normal and that blood plasma is lost into the tissues. If the burn is extensive, and it appears that shock will occur, transfusion is done in anticipation of shock and repeated if it occurs. It has been observed that these children tolerate relatively larger transfusions than those transfused for other conditions in which there is not such a great reduction of blood volume. These energetic measures have resulted in less vomiting, which materially simplifies the subsequent management. In our early experience the incidence of death from this origin in our lethal cases during the first 36 hours after the accident was 25 per cent. Although the cases of burns admitted to the hospital during the last two years have probably been quite similar in extent and severity there has been no mortality during the first 36 hours after the thermal insult from shock.



Fig. 15. Case 9. Showing the mobility of pinch grafted area with the development of a new subcutaneous tissue, which is attributed to doing the procedure early.

TOXEMIA

Should the individual survive the initial collapse, there is a later secondary toxemia. The temperature is quite elevated, the pulse is rapid and bounding, the skin is flushed, the psychic symptoms are those of a delirium, and muscular twitching and convulsions may be present. Vomiting may make the oral administration of fluids impossible. This syndrome generally occurs about thirty-six hours after the accident and persists about eight to ten days.

It has been shown that precipitation of the devitalized tissue with tannic acid limits absorption and prevents the loss of body fluids at the site of the burn by covering it with a parchment-like protective coagulum. It has further been observed that moistening this dried material immediately releases the toxic agent and causes a profound change in the patient. Because of these facts, the patient is kept in a light tent, on sterile sheets, and nothing further is done locally. The child is turned over to the nurses, whose duty is primarily to see that the intake of fluid is adequate.

Normal saline is given intravenously or subcutaneously daily in all extensive burn cases until the period of toxemia is past. Sedatives are given freely at night to insure rest, so that the day may be fully utilized for the administration of fluids. Thirty-three per cent of the lethal cases prior to our present method of management died of this origin. Since the adoption of these measures seventeen per cent of the lethal cases have died from the toxemia of burns.

SEPTIC TOXEMIA AND LATE TREATMENT

It has been observed that in second degree burns the coagulum acts as a splint and healing takes place beneath it and is generally complete at the end of two to three weeks (Fig. 11). Effort made to remove the coagulum before it has spontaneously separated has invariably resulted in the escape of serum and blood with subsequent infection due to moisture. Should the precipitated skin remain adherent at the end of three weeks, one may be certain that the burn is one of the third degree. It is relatively safe at this time to soak off small pieces of slough, but great care

must be exercised to avoid overwhelming the patient by releasing a large amount of toxin.

Children tolerate granulating wounds very badly. Cultures of these wounds generally show that the superimposed complication cannot be withstood.

In cases with large granulating wounds one is confronted with the danger of taxing the child



Fig. 16. Case 10. Showing characteristic deformity resulting from old burn of chest and neck. Chin-chest adhesions have formed and the anterior muscles of the neck have shortened. Large granulating wound with scar tissue base still present.

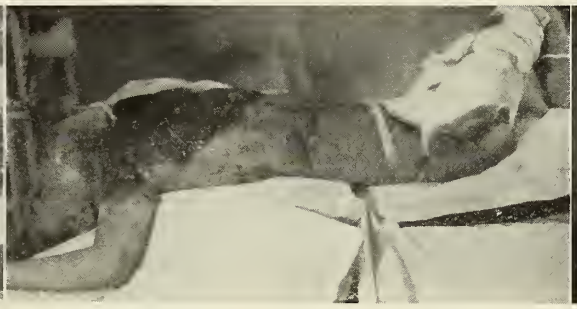


Fig. 17. Case 10. Debridement has been done of entire area. Pinch grafts applied to neck and upper chest.



Fig. 18. Case 10. Complete healing with correction of deformity. The cosmetic result remains to be taken care of later after the development of a new subcutaneous tissue under the graft.



Fig. 19. Case 11. Showing complete disability of both hands possibly aggravated by inadequate splinting and maintenance of separation of fingers.



Fig. 20. Case 11. Showing present stage of the correction.

the same organisms that are found on normal adjacent skin. Unless skin grafting is done promptly, the child develops the picture of exhaustion and succumbs, or some serious complication arises. Diarrhea, suppurative joints, otitis media, mastoiditis, pneumonia, pyelitis, septicemia, endocarditis, myocarditis, nephritis, as well as all the acute infectious diseases of childhood are seen with great frequency. It is our belief that many children are surviving the initial period during which they previously died, only to succumb later from some such complication. It is quite possible that the strength and resistance has been so impaired by the toxemia too greatly with the operation of skin grafting, but at the same time one must be aware that delay generally means a poorer surgical risk (Figs. 12, 13, and 14). As a result of this experience, we are grafting at the earliest possible date even in the presence of gross infection. This is generally accomplished in the third or fourth week after the thermal insult.

SKIN GRAFTING

It has been our custom to use pinch grafts for large denuded areas. These may be placed on an infected granulating area and still there is a reasonable chance for a successful take. Thiersch

grafts have been used on the exposed surfaces, because of the better ultimate cosmetic result.

It is desirable to skin-graft at the earliest possible date, not only to avoid exhaustion, but also



Fig. 21. Case 12. Showing the position maintained in burns of the axilla and arm to prevent the development of arm-chest adhesions.

to avoid contractures. When the grafting is done sufficiently early, a new subcutaneous tissue will form (Fig. 15). Contractures occur only when granulation tissue is permitted to heap up layer upon layer and subsequently to be covered with epithelium. Later this granulation tissue forms a scar tissue base which contracts and causes deformity. It is sometimes stated that a circular pinch graft of an extremity will later interfere with the venous and lymphatic return, and cause edema. This is true only if the granulation tissue is permitted to heap up previous to the grafting.

It is frequently found that a profound anemia has developed by the time the child is ready for grafting. The red blood cell count is rarely over three million per cubic millimeter, and the hemoglobin is usually under 50 per cent. It is desirable that the blood elements be restored to approximately normal by transfusion before grafting. Sluggish granulation tissue is remarkably improved by this procedure and the success of the graft insured.

DEFORMITIES

We frequently see old burns involving the chest and neck. The child has been permitted to have a pillow under the head. This invariably results in shortening of the anterior muscles of the neck with the development of chin-chest adhesions. In these cases it has been our practice to first correct the deformity by doing a complete debridement of the scar and granulating wound. The child is then placed on a Bradford frame with the head hanging downward (Figs. 16, 17, and 18). The wound is then covered with pinch grafts in an effort to obtain prompt epithelization. Six months to a year later the child is recalled and an effort made to get a satisfactory cosmetic result by the use of pedicle flaps, full thickness inlays or Thiersch grafts. The results obtained from these measures have been gratifying.



Fig. 22. Case 13. Showing method of correction after arm-chest adhesions have occurred. An anterior and posterior pedicle flap have been turned up to form a new high axilla.

Deformities of the hands in children are exceedingly common and in part are avoidable by proper splinting after the open method of treatment has been discontinued and the careful maintenance of separation of the fingers to prevent webbing. These measures often avoid the necessity of extensive plastic procedures which at times are exceedingly difficult (Figs. 19 and 20).

Burns involving the axilla are of great importance because of the serious disability caused by the formation of arm-chest adhesions. This deformity may largely be avoided by keeping the arm in abduction during the entire period of healing (Fig. 21). Should webbing occur, this may possibly be best corrected by dividing the web high into the axilla and turning an anterior and posterior flap into this newly formed axilla, and filling in the lower defect with either Thiersch or pinch grafts (Fig. 22).

CONCLUSIONS

1. The treatment of burns with tannic acid followed by exposure to air lessens toxemia.

2. Tannic acid as an initial dressing on a burn is analgesic.

3. The local astringent effect prevents the loss of body fluid.

4. Secondary infection is markedly limited by the absence of a favorable nidus for bacterial growth.

5. Scar tissue formation has been less marked than that observed after treatment by other methods.

6. The protective layer of coagulated protein forms a scaffold for the growth of the young epithelial cells over the denuded area.

SICKNESS AMONG INDUSTRIAL EMPLOYEES

In a report recently published the United States Public Health Service points out that an influenza epidemic was in progress during the final month of 1928, affecting adversely the rate of sickness in the fourth quarter of that year. For this reason the disability rate for the last three months of 1929 among a group of about 110,000 industrial employees makes a favorable comparison with the rate for the corresponding period of the preceding year. The frequency of disability from sickness lasting more than one week was 27 per cent lower in the fourth quarter of 1929 than in the same quarter of 1928. The respiratory group of diseases shows the greatest decrease, of course; the rate was little more than one-half that experienced in the last three months of 1928. Influenza and grippe decreased 64 per cent, and pneumonia 26 per cent from the incidence experienced during the fourth quarter of 1928. In the last three months of 1929, however, bronchitis and diseases of the pharynx and tonsils increased 13 and 9 per cent, respectively, but the incidence of tuberculosis declined 20 per cent, and the rate for respiratory diseases other than those mentioned above dropped 5 per cent from the rate of the fourth quarter of 1928.

It is quite possible that the recorded sickness presented above understates to some extent the real magnitude of the incidence rate of cases causing disability for more than one week, because a number of the reporting associations do not pay sick benefits for disability on account of the venereal diseases, for illness resulting from violation of any civil law, for the results of willful or gross negligence, and for certain other causes; and some associations do not pay for chronic diseases contracted prior to the date of joining the organization, for disabilities caused by or growing out of specific physical defects, nor for illnesses not reported within specified time limits. Of more importance, perhaps, is the fact that the reports come from the larger companies having well-organized employment and medical departments which make a physical examination of applicants, so that a somewhat favorably selected group from a health standpoint may result. Workers in poor health who doubt their ability to pass the physical examinations may tend to drift into the smaller industrial establishments where the physical condition of the applicant is usually given less consideration. As offsetting factors a few cases of malingering may be included in the records, and the associations with the most liberal sick-benefit provisions may attract persons when their health begins to fail. On the whole, it seems that the statistics presented may tend more toward understatement than overstatement of the average frequency of disability which lasts longer than one week among industrial employees.

THE EARLY DIAGNOSIS OF CARCINOMA OF THE STOMACH*

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CARCINOMA of the stomach presents a more important problem to the medical profession than is generally recognized. An attitude of indifference toward this serious affliction is apparent due to an impression that gastric cancer is rare and, in any event, an almost hopeless condition. Both of these premises are grossly incorrect. Actually the disease is not rare and, if diagnosed early, can, in many cases, be cured.

Gastric cancer is the most frequent type of fatal carcinoma. For example, in the State of New York, in 1928, carcinoma of the stomach and liver was the cause of death in more than one-third of all the carcinoma fatalities. Its nearest competitor in this respect, cancer of the female genitalia, caused less than one-fourth of all the deaths from cancer. In some areas the frequency is even greater. Considered in another way, carcinoma of the stomach and liver represent the causative factor in 4.6 per cent of all the deaths of individuals over the age of forty-five. This compares strikingly with about 1.5 per cent for cancer of the uterus and ovaries, 1 per cent for cancer of the breast, and 4 per cent for cancer of the buccal cavity. A comparison of this figure of 4.6 per cent for carcinoma of the stomach with pneumonia, which represents 3.8 per cent of deaths past the age of forty-five, or diabetes, which represents 2 per cent, indicates strikingly the grave importance of this disease as a cause of death. One out of every twenty-two deaths over forty-five years of age is due to cancer of the stomach or liver.

There is only one form of treatment for carcinoma of the stomach which holds out any reasonable hope of cure—radical surgery. This can only be effective in the cases which are diagnosed at an early stage and this is the problem which confronts us.

There are three major difficulties which prevent the early diagnosis of this condition. The first is the insidious character of the disease. There is hardly a condition which may progress so far with so little warning as carcinoma of the stomach. It is true that the patient usually has symptoms, but these are so similar to the gastric upsets which are such a common part of everyone's life that little or no attention is paid to them. The average individual finds a host of comparatively innocent reasons to account for the feeling of fullness after eating, loss of appetite, gas eructations, and slight epigastric distress which may be the very first symptoms of carcinoma. Too often attention is directed to decayed teeth, dietary indiscretions, nervousness and overwork, while the organic gastric disease is overlooked. In those cases where the lesion arises in the pylorus or near it, producing early obstruction, the symptoms are more striking and medical aid may be sought at an early stage.

The second factor of delay is due to the character of the patient. Poverty, ignorance, prejudice, or fear may prevent an individual who has severe symptoms from consulting a physician. Too often the cancer patient has gone to some type of quack or has taken some type of patent medicine before attempting to obtain competent medical advice. Frequently the fear of cancer actually keeps the sufferer from consulting a physician because he does not want to hear the truth.

These two factors have led to much of the anti-cancer propaganda which has been so widely disseminated amongst the public in the past few years. Although this educational campaign serves a very good purpose, it should really be made secondary to an educational campaign directed to the medical profession itself.

For it is in the physician that the third major difficulty in the early diagnosis of gastric cancer lies. Even if a patient comes to a regular practitioner when his lesion is in an early stage, the chances are extremely good that it will not be recognized and that dangerously dilatory treatment will be given until it

*From the Departments of Roentgenology of the University of Minnesota and the University Hospital, Minneapolis, Minnesota. Read before the Minnesota State Medical Association, Duluth, Minnesota, July 15, 1930.

is too late. This is the problem which the medical profession faces. There is no great benefit in urging the layman to consult a physician when he has symptoms of cancer of the stomach if the physician does not recognize the condition when he sees it. Dr. Jacob Sagel and I have been making an intensive study of the histories of all the cases of carcinoma of the stomach which have presented themselves at the University and Minneapolis General Hospitals during the past year. In this series the patients had consulted a doctor within three months, on the average, after the onset of recognizable symptoms. The diagnosis, however, had been delayed from six months to two years after the physician had been called in. This delay was due to either inadequate examination or the inability of the practitioner to recognize the findings in gastric carcinoma. Likewise no adequate treatment had been given, with the result that the majority of cases seen were inoperable. The medical histories of these patients represent a serious indictment of the medical profession. They indicate clearly that cancer of the stomach is not being taken seriously enough by the average physician and that he is making no great effort to further its early diagnosis. On the contrary there appears to be a tendency to give drugs such as alkalies or hydrochloric acid and watch the patient for long periods of time until the symptoms and signs are unmistakable.

How can the diagnosis of carcinoma of the stomach be made in an early stage? In the later stages, the marked loss of weight, cachexia, palpable mass, vomiting, often bloody, serve frequently to identify the disease without elaborate procedures. But the diagnosis at this stage is worth very little to the patient as surgery will probably be ineffectual. In the early stages, on the other hand, the physical examination is usually negative. The history, if carefully taken, may be suggestive of carcinoma, but a diagnosis on the history alone is hardly possible and would lead to numerous errors both positive and negative. The best method of diagnosis is by a competent *x*-ray examination. In experienced hands, this is one of the most accurate procedures in medicine. Such statistics as have been presented by Carman, from the Mayo Clinic, or Merrill, from the Massachusetts General Hospital, indicate that the diagnosis can be correctly made by the roentgen method in 92 to 98 per cent of the cases. Obviously this diagnostic accuracy is greater than could be achieved under averaage conditions, but it indicates the possibilities of the method.

Unfortunately all patients who come to the physician complaining of gastric symptoms cannot be given a roentgen examination. It would hardly be, either economically or socially, feasible. Some selection must, therefore, be made. First of all, every patient past the age of forty who has gastric complaints should be looked upon as a cancer suspect. Most of them will not have carcinoma, it is true, but for the sake of those that do we must examine all of them with the greatest care. The age limit is placed at forty because the vast majority of cases occur past this age, but we must bear in mind that carcinoma of the stomach occasionally occurs in much younger persons also.

In these case, at least, in addition to the usual examinations, two procedures should always be undertaken. The first is a gastric expression with determination of the presence or absence of free hydrochloric acid; the second, an examination of the stools, under proper conditions, for occult blood. Neither of these tests are pathognomonic, but both are comparatively simple and can be done by any physician in his office. Therein lies their value. The presence of free hydrochloric acid in the gastric contents does not rule out carcinoma of the stomach, but makes its presence somewhat less probable. The absence of free hydrochloric acid in the gastric contents, especially if the histamine test has not been used, is also not of any great significance, yet it makes it more probable that carcinoma of the stomach may be present. Likewise the absence of blood in the stools does not rule out gastric cancer but makes its presence somewhat less probable. The presence of occult blood in the stool is of considerable significance as indicating that the gastro-intestinal tract is not normal and that cancer may very well be present. If either or both of these findings are present, that is, the absence of free hydrochloric acid in the gastric contents and the presence of occult blood in the stool, then certainly the

physician is not only justified but ethically compelled to urge strongly the need for further examination. The absence of either of these findings should indicate some conservatism of treatment but the persistence of symptoms for more than a monh after the institution of medical treatment should also be an indication for further examination. The most important part of this further examination is a thorough and competent roentgenoscopic and roentgenographic examination of the stomach.

By selecting cases in this manner, the *x*-ray examination of the majority of patients with carcinoma of the stomach may become feasible. The possibilities of very early diagnosis by this method are not well known. So few cases are referred for roentgen examination at an early stage that it is difficult to determine how accurate the method would be under those conditions. The author has had striking evidence, however, in a number of cases which indicate the remarkable possibilities which are present. In some cases, for example, it is possible to demonstrate by *x*-ray examination a carcinoma which is so small that the surgeon cannot palpate it after the abdomen has been opened. I have seen one case in which the pathologist was doubtful as to the presence of any lesion on gross examination of the portion of the stomach removed at operation, although the lesion was perfectly obvious on roentgenoscopic and roentgenographic examination. It is possible, in many cases, by the careful use of both the roentgenoscope and films, to distinguish between benign and malignant gastric tumors. I have been able, in two cases, to demonstrate both types, independent of each other, in the same stomach. The demonstration of a benign papilloma of the stomach can frequently be made and thus a possible precursor of gastric cancer can be removed. The distinction between benign and malignant gastric ulcers can also be made by the roentgenological method, but with greater difficulty. It must be borne in mind that benign ulcers, adhesions, spasm and other functional conditions, and pressure from extra-gastric lesions may simulate carcinoma and must be ruled out.

The difficulty of the *x*-ray examination of the stomach cannot be over-emphasized. It is no doubt the most exacting type of roentgen examination to make and perhaps is one of the most difficult diagnostic procedures in medicine. The importance of the experience and competence of the examiner can therefore not be overestimated. While in the hands of a Carman the diagnoses may be 95 per cent correct and 5 per cent in error, in the hands of a tyro the figures may very well be reversed. The possibility of overlooking a small carcinoma of the stomach is so great and the consequences so serious that the greatest care must be exercised in making the examination. In addition to the competence of the examiner, an adequate equipment is necessary in order that good roentgenograms may be made.

It is not within the province of this paper to consider the technic of the examination and the diagnostic criteria in detail. In brief it may be said that the best method consists of a combination of roentgenoscopic and roentgenographic examinations. For the inexperienced examiner it is especially important that a large series of good films of the stomach in several positions be made as small lesions may be easily overlooked on roentgenoscopy alone. In determining the presence of a small carcinoma, the absence of peristalsis in a portion of the stomach wall, rigidity to manipulation, and loss of the usual rounded contour are probably the most important signs. The presence of a small filling defect almost resembling a finger print on the film is also a frequent and important sign. In general the findings may be the same as in advanced carcinoma except that they are smaller and more difficult to observe. It is well to remember also that repeated roentgen examination is a justifiable and necessary procedure. A small lesion overlooked at one examination may be seen the very next day when the examination is repeated. If a few weeks or a month is allowed to intervene between examinations, the diagnosis of a doubtful case may become certain. Too often a negative diagnosis is taken as final in spite of the character of symptoms which should clearly indicate the necessity for repeating the procedure. By considering carefully all the clinical and roentgen evidence, by seeing and examining the patient repeatedly, the diagnosis of carcinoma of the stomach may be made at a much earlier stage than is done at present.

SUMMARY

Carcinoma of the stomach is the most frequent cause of cancer mortality and is one of the common causes of death in the later decades of life.

The importance of early diagnosis lies in the fact that small lesions are frequently curable by radical surgery.

The average physician fails to recognize these cases until long after they have become inoperable.

Every patient past the age of forty with gastric symptoms should have a thorough examination including especially gastric analysis, stool examination and a competent *x*-ray examination of the stomach.

The latter, in experienced hands, is one of the most accurate procedures in medicine. The early diagnosis and the cure of carcinoma of the stomach would be greatly facilitated if more patients with gastric complaints were thoroughly examined by the roentgen method.

FUNERAL DIRECTORS COÖPERATE IN HEALTH WORK

The following excerpts are taken from an address by Dr. H. Jackson Davis, epidemiologist, on "How Funeral Directors Can Help in the Control of Communicable Diseases," delivered before the annual convention of the New York State Funeral Directors' Association. The excerpts were originally printed in Health News, August 25, 1930.

In his capacity as a sanitarian, it is the duty of the funeral director to protect his associates and the public from the dangers of communicable diseases. The possibility that the presence of a communicable disease may not have been recognized presents the greatest danger for the funeral director and his assistants. This is strikingly shown in the following instances:

A few years ago, in a neighboring Canadian Province, approximately forty cases of unusually severe smallpox and twenty-one deaths were directly traced to a case and death from hemorrhagic smallpox which was not diagnosed as such. A considerable number of these cases were exposed only at the time that they attended the funeral of the initial case. This epidemic would have been prevented if those in contact with the patient, before or after his death, had been recently vaccinated. As a matter of fact, in this outbreak, more than 50,000 people were vaccinated within a space of ten days and the epidemic was checked.

The second instance involved an undertaker's assistant who had never been vaccinated. A man, 74 years of age, left Illinois in the spring of 1924, to visit his brother who resided in a small isolated village in New Jersey. He was taken ill 13 days after his departure for the east and died a week later, death being ascribed to kidney disease and heart failure. The body was embalmed and shipped back west. The undertaker's assistant, a man 48 years of age, who helped embalm this body, was taken ill within two weeks, with what proved to be a severe case of smallpox from which he eventually recovered. He had not been away for several months and insisted that he had seen no one whom he suspected might have had smallpox. He distinctly recalled, however, having seen an eruption identical with his own on the corpse he had helped embalm. About the time that the undertaker's assistant became ill, another severe case of smallpox developed in a woman living in the household in which the Illinois resident had died.

It was later learned that just before going east, the man who died had been exposed to a case of smallpox in the house in which he boarded. Hence, the presumption seemed warranted that he had died in the early stages of hemorrhagic smallpox, undiagnosed as such.

Vaccination is a safe and harmless preventive of smallpox. Less than half of one per cent of all persons having smallpox in upstate New York during the past five years gave any history of having claimed to have been successfully vaccinated within seven years preceding the attack. Funeral directors should not only apply scientific principles of disinfection and cleansing in their work but should see that every individual who is associated with the preparation of bodies for burial is vaccinated every three years.

EARLY DIAGNOSIS AND TREATMENT OF MALIGNANT CONDITIONS OF THE MOUTH AND LIPS*

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MALIGNANT tumors of the mouth and lips, because of the possibility of their being recognized early, because of their accessibility, and because of the ease with which the lymphatic drainage of these areas can be blocked, offer a good prognosis in a high percentage of cases if proper treatment is instituted promptly. The patient usually is aware of the presence of trouble in this region earlier than in almost any other portion of the body. Indifference due to lack of appreciation of the possible seriousness of the condition, however, often leads him to delay seeking medical advice. At an early stage the lesion looks no different to him than inflammatory ulcers, fissures or traumatic areas that have appeared in the same region many times previously and that have healed spontaneously. The persistence of the lesion, or its increase in size, ultimately arouses his suspicion of its possible seriousness. Then, if he is wise, he seeks the advice of his family physician. If he is not wise, he visits a cancer quack. Various educational measures have been carried out in recent years by different medical organizations. These measures include the institution of "Cancer Week" and the delivering of lectures on public health. They have resulted in fewer patients with questionable conditions of the lip and mouth visiting the charlatan, whereas increasing numbers are coming to the physician when the growth is still in an early stage.

The treatment most commonly used by the quack consists of applications of an escharotic, usually an arsenic paste. If the destruction is carried out sufficiently widely this often cures the local growth. Otherwise, as with any incomplete treatment, increased activity results. As a rule, an appreciable portion of the lip is lost, with the production of more or less deformity. This, however, is of minor consideration, in view of the seriousness of the condition. One of the principal objections to this type of treatment is that no attempt is made to determine the nature of the growth. The lesion is treated in the same way, whether it is inflammatory, or a benign or malignant neoplasm, but the patient is always given the impression that it is malignant. Of greater importance, however, is the fact that the patient receives a false sense of security. As a rule, consideration is not given the lymphatics which drain the area. Therefore, later, when an enlarged node appears in the submental or the submaxillary region, as occurs in from 20 to 30 per cent of cases even if local recurrence is absent, the patient does not appreciate the seriousness of the situation and often allows the condition to progress to an inoperable stage.

On the other hand, physicians also are capable of making errors. Even though the patient with such a lesion consults his physician first, it is by no means a certainty that he will receive treatment which will offer him the greatest assurance of cure. Many times, on account of the insignificant appearance of the lesion, silver nitrate or other mild caustic is applied, or it is decided to try radium or roentgen rays. If the lesion is already malignant, this attempt to determine what these different agents will accomplish is likely to deprive the patient of his best chance to get well. Such treatment is usually incomplete and stimulation of the growth, with increased possibility of metastasis, often results. Every precancerous lesion should be given the same consideration as lesions that are malignant, until their benign character is definitely established. In an adult a high proportion of chronic sores of the mouth or lip are malignant, and it is inexcusable to treat such a condition without first making every effort to establish a diagnosis. As a matter of fact, the possibility of malignant change in such lesions is not limited to adults alone. Many times epitheliomas of the lower lip are encountered in persons in their early twenties or even in their teens. At The Mayo Clinic an epithelioma of the lower lip was excised recently from a boy aged thirteen years (Fig. 1). If the area on the lip has a slightly indurated border, the diagnosis may be evident on clinical examination alone, to one of sufficiently wide

*From the Section on Laryngology, Oral and Plastic Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Duluth, July 14 to 16, 1930.

experience. In approximately half of the cases, however, a microscopic examination only will permit of an accurate diagnosis. This is particularly true of lesions which have their origin in areas of leukoplakia, especially of syphilitic type (Figs. 2, 3 and 4), chronic thrush, recurring chronic fissures, and other ulcers of the mouth and lip which are inflammatory only. Such lesions can be excised readily under local anesthesia, without appreciable deformity, and following microscopic study treatment of the lymphatics can be carried out, if it is indicated. If the growth is so large or is so situated as to render complete excision inadvisable, there should be no hesitancy in removing a portion for biopsy. Lesions that have been treated previously present the greatest difficulty from a diagnostic standpoint. Biopsy is frequently unsatisfactory in these cases, because the marked inflammatory reaction renders the results of microscopic study uncertain. Many times observation over a period of several weeks, or even of months, may be necessary in order to establish a diagnosis.

Little is to be gained by reviewing the controversy existing between surgeons and radiologists as to the most effective method of treating carcinoma of the mouth and lip. The comparative prognosis with operation and with irradiation is the criterion on which choice of treatment should hinge. The negligible difference in the cosmetic result and the slight operative risk associated with the surgical treatment of such lesions are of minor consideration, although to the lay mind they are often outstanding. It is now generally conceded that a combination of operative procedures and irradiation offers the best prognosis in the majority of cases.

The type of tumor and the rapidity of its growth are most important considerations in determining the treatment advisable in a given case. Broders' method of grading carcinomas according to their activity as evidenced by cellular differentiation and formation of keratin has been of inestimable value from the standpoint of prognosis and treatment. This grading by microscopic examination has, with few exceptions, corresponded strikingly with the clinical course of the disease. The slow-growing, mildly malignant lesions are designated as of grade 1, and the successively more active growths as of grade 2, 3, and 4, respectively. In lesions graded 1 the local growth is, as a rule, readily controlled and extension in the lymphatics is not likely to occur. Tumors graded 4 present rapid local growth, matastasize widely, and are prone to recur

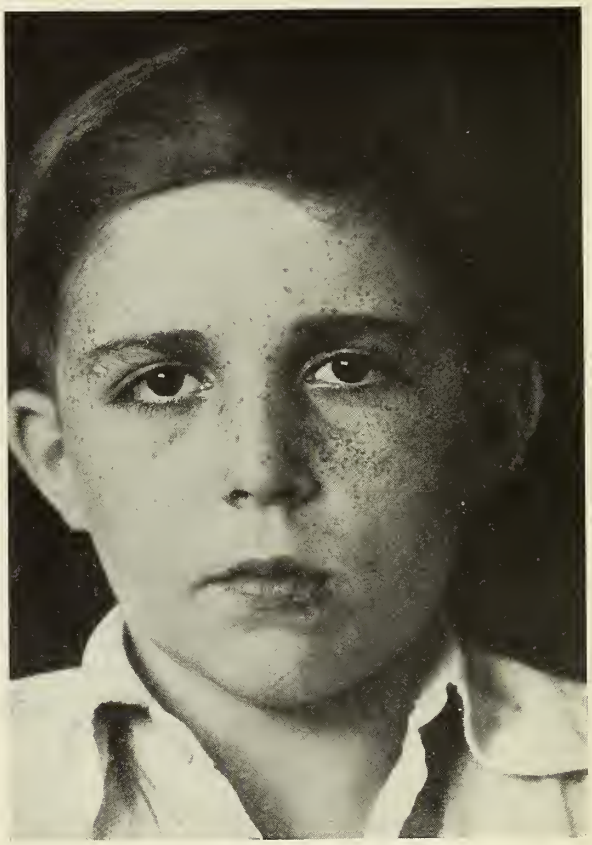


Fig. 1. Boy aged 13 years with squamous cell epithelioma of lower lip.

promptly following removal. Lesions of grade 1, 2, or 3, if they are surgical, should be excised or destroyed with the actual cautery or diathermy, and the regional lymph nodes should be removed subsequently. With neoplasms of grade 4, intensive irradiation should be directed against both the local lesion and the regional lymphatics. The primary growth is also treated surgically at times, but irradiation constitutes the major part of the treatment.

In the clinic, epitheliomas of the lip are removed surgically unless there is definite contra-indication to operation. The risk associated with the removal of such growths, together with the regional lymphatics, has been found to be so slight that comparatively few contra-indications exist. Even though the lesion is extensive, if it is of a low grade of malignancy, and if there is no attachment to the mandible, immediate

plastic reconstruction of the lip is permissible. After removal of the entire lower lip, sufficient tissue can be brought in from the cheeks to restore the lost parts satisfactorily, both as regards



Fig. 2. Squamous cell epithelioma of lip.

function and cosmetic appearance. If the growth is active and involves the cheeks, or if it is attached to the mandible, wide excision with the cautery knife, or destruction by surgical diathermy, leaving the wound wide open, is advisable. Thorough cauterization of the surface of the mandible over the area of attachment is necessary in such cases. Plastic reconstruction of the lip is deferred until the patient has been free from evidence of trouble for at least nine months to a year, depending on the extent and activity of the growth. It may then be effected by means of a lined flap from the forehead, a triangular flap from the upper lip, or a tube flap from the thorax. Removal of the submental and submaxillary lymph nodes on either side, as well as of the upper jugular group of nodes on the side of the involvement, is carried out in all surgical lesions of the lip. This is usually done at an operation subsequent to the one at which the primary growth is removed. If excision by cautery has been necessary, dissection of the nodes must, as a rule, be deferred for about three weeks. However, this may be done before the operation on the lip. If involvement of the nodes is obvious on clinical examination, the operation on the nodes usually precedes treatment of the primary growth. In all cases in which involvement of the nodes is demonstrable at operation subsequently, intensive treatment by roentgen rays or radium is given. If the patient's age or general condition contra-indicates surgical operation, the lesion of the lip, and the lymphatic structures, are treated with irradiation alone. As a rule, dissection of nodes is not carried out if patients are aged more than seventy years, unless the growth is distinctly active and the patient's general condition is unusually good, since there is less likelihood of extension by the lymphatics if patients are advanced in years. Lesions that have received treatment with irradiation previously must be treated more widely, and the possibility of recurrence is greatly increased.

The treatment of carcinoma involving the insides of the cheeks is much the same as that of carcinoma of the lips. Small, superficial epitheliomas in this region may be excised with the cautery knife. As a rule, however, these lesions, as well as the extensive ones, are more readily and satisfactorily treated with surgical diathermy. If the tumor is perforating the cheek, the full thickness of the cheek should be excised with the cautery knife. The defect should be left wide open and should be closed later by means of a plastic procedure. Radium is often used as an adjunct in these cases; radon points are inserted into the wound at the time of the operation, or the plaque or tubes are used later. If metastasis from carcinoma of the cheek takes place it invariably appears on the same side as that of the lesion unless the growth is extremely active or has been treated previously with irradiation. Dissection of the nodes as a rule is deferred until about three weeks after the operation in the mouth, although if there has been clinical evidence of involvement it may be done the following day providing there is not too much local reaction.

The malignant tumors of the jaws consist of epitheliomas, sarcomas of different types, and adamantinomas. Epitheliomas are by far the most common. A large percentage of these are of low grade or moderate activity. They may

vary from the inactive lesions which develop in areas of papillary leukoplakia to fulminating, sarcoma-like neoplasms, graded 4. The clinical appearance presented by these neoplasms of varying activity is distinctive, although this difference is difficult to describe accurately; in general, the softer, more friable and more vascular the lesion, the higher its grade of malignancy.



Fig. 3. Epithelioma developing in area of syphilitic leukoplakia inside right angle of mouth. Area of leukoplakia posterior to angle of mouth on opposite cheek may be noted.

Epitheliomas of the jaws are better treated by surgical diathermy or the actual cautery than by resection. In the very active growths, intensive irradiation is used in addition to surgical measures, and reliance is placed chiefly on this. Diathermy in these cases is used chiefly to coagulate the tumor and its attachment, thus producing a dry, sterile bed into which radon points may be inserted. In low-grade epitheliomas, surgical measures are relied on almost entirely. The regional lymph nodes in these cases present much the same problems as in cases of epithelioma of the lip and cheek, although, if the lesion is confined to the alveolar process alone, metastasis is much less likely to occur than when the adjacent soft tissues are involved.

Most of the malignant tumors of the body of the tongue are epitheliomas. They are, as a rule, easily recognized clinically. Because of the danger of early metastasis from such lesions, it is especially important that a definite diagnosis be established and treatment be instituted promptly. Surgical lesions of the tongue may be excised sharply or with some form of cautery knife. Often radium seeds are inserted into the open wound prior to suturing. Closure of the wound following excision, either by the knife or with the cutting cautery, usually is followed by primary healing. If radium points are inserted, the wound frequently will open later. When the growth on the tongue is extensive or the floor of the mouth is involved, surgical diathermy is preferable to excision. Following surgical diathermy there is increased danger of secondary hemorrhage on separation of the slough. As soon as the wound in the tongue permits, a bilateral dissection of the submental and submaxillary nodes with a cervical block on the side of the involvement is done if the patient's general condition warrants. If the patient is not a good surgical risk, more conservative dissection of the nodes is carried out. All patients with carcinoma of the tongue receive intensive irradiation of the regional lymphatic structures, regardless of the type of treatment used on the local lesion.

The results following early treatment of carcinoma of the lip in the clinic are extremely satisfactory in the majority of cases. More than 90 per cent of the patients are well after five to eight years in the cases of such lesions in which the lymph nodes were removed along with the lesion of the lip before there was demonstrable

evidence of involvement. If the nodes are involved at the time of removal the chance of cure is markedly reduced, even if more extensive resection of lymph nodes is carried out. Studies



Fig. 4. Squamous cell epithelioma of tongue developing on syphilitic leukoplakia.

made by Broders in 362 cases of carcinoma of the mouth and throat in which operation was done in the clinic between 1904 and 1915 disclosed that more than 65 per cent of patients without metastasis from malignant tumors of the mouth obtained good results. Of patients without metastasis from carcinoma of the tongue 50 per cent were well. If treatment of carcinoma of the mouth was delayed until after the lymph nodes became involved, the prognosis was much less satisfactory. In recent years irradiation to supplement surgical measures has been used as a routine. Such treatment should yield an increased number of cures, although statistical studies of results have not yet been completed.

CONCLUSIONS

1. Treatment should never be instituted in any chronic lesion of the mouth or lip until a diagnosis has been established. If this procedure were carried out as a routine, the prognosis in malignant tumors of this region would be greatly improved.

2. The treatment advisable in a given case of malignant growth of the mouth or lip is dependent on the age of the patient and the extent and activity of the growth. Operation is more effective in lesions of low grade and in those of moderate activity, whereas irradiation is preferable in highly malignant tumors. Surgical measures, supplemented by irradiation, offer the best prognosis in the majority of cases.

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THE EARLY DIAGNOSIS OF CANCER OF THE UTERUS*

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CARCINOMA of the uterus must, clinically, be divided into that involving: (1) the cervix; and (2) the body of the uterus.

Carcinoma of the body of the uterus has a far more favorable prognosis, both in its early and late stages, than that of the cervix. By this I mean that a late diagnosis of cancer of the body of the uterus is not so disastrous as a late diagnosis of cancer of the cervix.

As a matter of fact, the infrequency of cancer of the body of the uterus makes it more easily overlooked, and although extension of the cancer, either direct or by metastases, is slow, one must ever be on his guard in cases of menorrhagia or metrorrhagia occurring after thirty-five years of age. The first thought should be of cancer, especially when no other demonstrable tumors can be felt on bimanual examination. The proper procedure in these cases is to do a diagnostic curettage and submit the curettings to microscopic examination. I fear that at the present time this method of arriving at a diagnosis is not used as frequently as it should be, and really it affords the only safe way by which a diagnosis can be made.

The treatment in these cases lies between: (1) a complete hysterectomy, which can be done with greater prospect of cure than when the case is one of carcinoma of the cervix; and (2) the use of radium. Both methods may be used. Fortunately the prognosis is good.

On the other hand, the other type of carcinoma of the uterus, that is, carcinoma of the cervix, exacts, according to statistics, a toll of 10,000 deaths every year. This is a story more sad than that of cancer of the breast.

Fluhmann reports a large series of cases of carcinoma of the cervix in which, at the time the patients presented themselves for examination, 71 per cent were far advanced and 28 per cent showed limitation to the cervix, leaving a small margin of from 1 to 2 per cent in whom early cancer of the cervix was found. Other writers have reported similar statistics showing that over 95 per cent of all patients who presented themselves with cancer of the cervix were far beyond the so-called stage of early diagnosis and afforded a very poor prognosis for even a three to five year cure.

Clark and Ferguson show that of all patients who came under observation within six months of the first symptom manifest to the patient, 60 per cent were inoperable and that one in seven had a chance for a five year cure, while, if they had presented themselves for examination some time after the six months period in which the symptoms first developed, only one in twenty-six had a chance for a five year cure. Is it any wonder that we should exert ourselves to search for and attempt to recognize early cancer of the cervix, or seek for methods which will prevent the formation of this dreaded disease.

Unfortunately it is impossible to tell, from the clinical or microscopic picture, how long a cancer has been present. But more can be told as to the prognosis.

In Schmitz's clinical classification the cases are divided into four groups:

1. A simple localized growth or nodule with no infiltration.

2. Beginning infiltration within the confines of the cervix.

3. Invasion into the parametrium, easily determined by rectal examination.

4. The presence of necrosis, infiltration, sepsis, etc.

With each successive stage the prognosis becomes more grave. With this clinical classification must be coupled Broders' classification of the microscopic picture in which he has shown that the more a neoplastic cell approaches the normal cell, the less malignant the tumor, and, conversely, the more malignant the tumor, the more undifferentiated or more embryonic the new cells. It seems to me that Schmitz's classification as well as Broders' must be kept in mind in estimating the prognosis in these cases of carcinoma. At best the usual case of carcinoma of the cervix has developed beyond the favorable stage.

*From The Duluth Clinic, Duluth, Minnesota. Read before the Annual Meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

In view of these statistics does it not behoove us to consider what can be done to prevent carcinoma of the cervix?

The cause of carcinoma, of course, is not definitely known, but clinical experience has shown that certain factors, namely irritation and infection, have an etiological bearing.

Pemberton and Smith have shown that cancer of the cervix is preceded by pregnancy in 90 per cent of the cases. Pregnancy leaves as its aftermath cervical laceration or infection, or both. Naturally, then, our attention should be directed to these conditions.

The subjective symptoms consist of vaginal discharge and uterine bleeding in some form.

Vaginal discharge in a very large percentage of cases is due to inflammation or infection of the cervix. The few exceptions are probably those cases of infection with Trichomonas vaginalis. Clark and Ferguson report that 25 per cent of their cases presented themselves with discharge in some form.

Bleeding may be simple spotting, irregular or profuse bleeding, or bleeding upon irritation. Clark and Ferguson have shown in their series that 75 per cent of the cases presented themselves with hemorrhage in some form. These two salient facts, vaginal discharge and bleeding, must not be lost sight of.

Certain points in diagnosis should be emphasized:

1. A digital as well as a speculum vaginal examination should be made in all cases of bleeding that are irregular in any form. A speculum examination should be made in all cases of vaginal discharge and the cause of the discharge determined.

2. The general appearance of the cervix must be determined and certain facts ascertained: is it lacerated, does it bleed on manipulation, is it soft when touched with the forceps, are there any hard, isolated nodules, is it papular?

There features are not necessarily apparent in the vaginal portion of the cervix, but also must be searched for in the cervical canal itself. One must always bear in mind that an early diagnosis of cancer of the cervix is very difficult to make clinically.

A positive diagnosis can only be made by doing a biopsy in all suspicious cases. The patient need not necessarily be sent to a hospital for a biopsy. It can be done in the office. It is not painful. The fear that one may have that if it is a cancer, it may be spread by using a knife, can be allayed by the fact that one can cauterize the base of the cut surface and seal the lymphatics.

To my mind much can be done by cleaning up these eroded cervices by using the nasal cautery, burning down the erosions and ectopions and establishing a healthy, non-infected cervix. This is a simple office procedure and does cure these cases. In my opinion one is grossly negligent who ignores this responsibility. This is especially true in the postpartum stage, but should be done in all cases and the age of the patient should not have any bearing as regards this prophylactic measure.

Pemberton and Smith report that in a series of 3,814 trachelorrhaphies, 740 amputations if the cervix and 1,408 cauterizations of the cervix (a total of 5,962 cases seen in the Free Hospital for Women), only five cases were known to have developed cancer and these were in the trachelorrhaphy group. It seems to me this speaks volumes for the efficiency of cauterization and the cleaning up of infected cervices.

In those cases of carcinoma of the cervix discovered early, radium or hysterectomy, or both, offer a very favorable prognosis. As to the relative merits of hysterectomy or radium treatment, I will leave that to your own judgment.

SUMMARY

In all cases of irregular bleeding coming from the body of the uterus one must bear in mind the possibility of cancer and a diagnostic curettage should be done.

Forty per cent of all cancers in women are in the uterus.

Ninety-five per cent of all cancers of the cervix that are demonstrable at first examination at the office offer a very unfavorable prognosis for cure. Therefore, one should make every possible attempt to arrive at as early a diagnosis of cancer of the cervix as possible, and every measure of prophylaxis against the development of cancer should be instituted.

Free use of the nasal cautery, the repair of lacerations, and amputation of the cervix as indicated, give us our best hope to date in the prevention of cancer of the cervix.

Every vaginal discharge or irregular bleeding

should be thoroughly investigated to determine its cause and that cause removed.

Only by very rigid methods of examination can we hope to obtain any measure of relief in the prevention of cancer of the uterus.

The slogan for all lesions of the uterus should be:

"Early diagnosis — thorough investigation — immediate treatment."

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CARE OF VETERANS

The following resolutions offered by the Board of Trustees of the American Medical Association were adopted by the House of Delegates at the annual meeting in Detroit in June and a copy sent immediately to the President of the United States:

Resolved, That, in the opinion of the House of Delegates of the American Medical Association, legislation to extend in point of time the presumption of service origin of diseases and injuries from which veterans are suffering, to establish arbitrarily the service origin of such diseases and injuries, and to extend greatly the category of such diseases, is without sound basis in the science and art of medicine;

Resolved, That the provisions of such legislation to the effect that lay evidence as to the nature and extent of diseases and injuries is to be given added consideration will give to such evidence weight to which it is in no way entitled and cause pressure on the Veterans' Bureau to allow claims for compensation without adequate medical support;

Resolved, That legislation recently enacted providing for the enlargement of the hospital facilities at the command of the Veterans' Bureau for the care of veterans, rich and poor, who desire hospitalization and treatment for diseases and injuries that admittedly have no relation whatever to military service is unsound and communistic in character and the pending proposal to allow such veterans as are of financially limited means bonuses and money to add to their own comforts while they are in the hospital and to help support their families during that period and for limited periods thereafter is calculated to induce patients to seek hospital care through the Veterans' Bureau when such patients should be better and more economically treated as ambulant patients or treated in their own homes;

Resolved, That the duty of providing medical and hospital care and financial relief for indigent citizens of any state, when disabled by diseases and injuries that did not originate in the line of military duty, is a function not of the federal government, but of the governments of the several states and should be discharged through state agencies, including permanently established state, county, municipal and private hospitals; and

Resolved, Further, that a copy of these resolutions be sent to the President of the United States.

THE DIAGNOSIS OF MALIGNANT CONDITIONS OF THE COLON*

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TO set down in sequence a chain of symptoms produced by carcinoma of the large bowel is difficult, if not impossible, particulary if one limits oneself to the earlier manifestations of the disease. The reasons for this are that the colon is at least a bifunctional organ and the symptoms of malignant neoplasms vary according to (1) situation, (2) pathologic type, and (3) the presence or absence of complications, such as metastasis, ulceration, or perforation.

Functionally, the right half of the large bowel is the absorptive portion, and the left half is concerned mostly with storage. Fluids are extracted from the intestinal content as far around as the middle of the transverse colon, and the hardened, dry, formed feces are deposited beyond this portion of the bowel to be expelled periodically without having many products extracted from them. The proximal half of the large bowel develops, with the small bowel, from that portion of the primary alimentary canal which is called the midgut, and functionally it corresponds with the small bowel. The distal segment is developed from the hindgut.

In general, it may be said that approximately 25 per cent of all the carcinomas of the colon occur in the sigmoid flexure, and about 15 to 18 per cent occur in the cecum and ascending colon. Next in order comes the mobile transverse segment, with its two fixed points, the hepatic and splenic flexures.

These anatomic divisions are important from the standpoint of symptoms only, because obstruction may occur at the angulations. For practical purposes, as related to the syndrome of symptoms, one may consider the right half of the colon around to the middle of the transverse segment one organ, and its fellow of the opposite side a different organ, pathologically, clinically, functionally and developmentally. The differences in symptoms of the two segments are mainly the differences in physiologic evidences of pathologic changes as demonstrated by growths of the right side, and intestinal obstruction, chronic, subacute or acute, as evidenced by lesions of the left half of the colon. Pathologically, the two halves of the colon show marked differences, although the majority of the growths are of the adenocarcinomatous variety.

In the right half of the colon one finds large, flat, ulcerating growths which frequently are covered with stubby protuberances like granulation tissue, and over which often is spread a dirty, necrotic exudate. These growths usually lie on the lateral wall of the bowel, and in this segment of the colon do not tend to produce obstruction because of (1) the liquid nature of the fecal current in this situation, (2) the lack of tendency of the growth to encircle the bowel, which has a greater lumen than elsewhere in its course, and (3) the likelihood of the growth to go on to penetration, perforation or abscess formation.

In the main, it may be said that cases of malignant growths of the right half of the colon may be classified according to symptoms under three headings: (1) cases in which the diagnosis is dyspepsia, mild in character and with few localizing symptoms, or in which the diagnostic term is a synonym of the vague term intestinal indigestion or chronic appendicitis; it must be said that cases of this kind are insidious of onset, slow of progress and frequently advance to tumefaction or some complication before they are recognized; (2) cases in which weakness and loss of weight, loss of strength, and anemia are the outstanding symptoms, and (3) cases in which there is the discovery, accidental or otherwise, of a tumor in the right iliac fossa, hitherto unsuspected.

In the first group are a relatively large number of carcinomas of the right half of the colon. Because of this I would call attention to the fact that carcinomas of the whole colon, in their earliest stages, in probably 95 per cent of the cases, have very few pathognomonic symptoms and usually are evidenced by change of intestinal habit or by intestinal irregularity,

*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Duluth, July 14 to 16, 1930.

such as mucous diarrhea, or alternating periods of constipation and diarrhea. The obvious corollary to this is that one should have a thorough investigation of the gastro-intestinal tract if change of intestinal habit or irregularity persists over a period of, for example, one week to one month. I am confident that this would obviate many of the disasters which one finds among patients who present themselves in the late stages of the disease, and in which formation of abscesses, penetration, perforation, or distant metastasis has taken place, precluding surgical intervention or, at least, limiting it to palliative measures. Pain and local tenderness over the cecal area, simulating subacute or chronic appendicitis, and without a tendency to disappear entirely, should call attention to the necessity of gastro-intestinal examination, because occasionally these are among the early symptoms to be found.



Fig. 1. Filling defect in proximal part of descending colon near splenic flexure. Carcinoma (surgically substantiated).

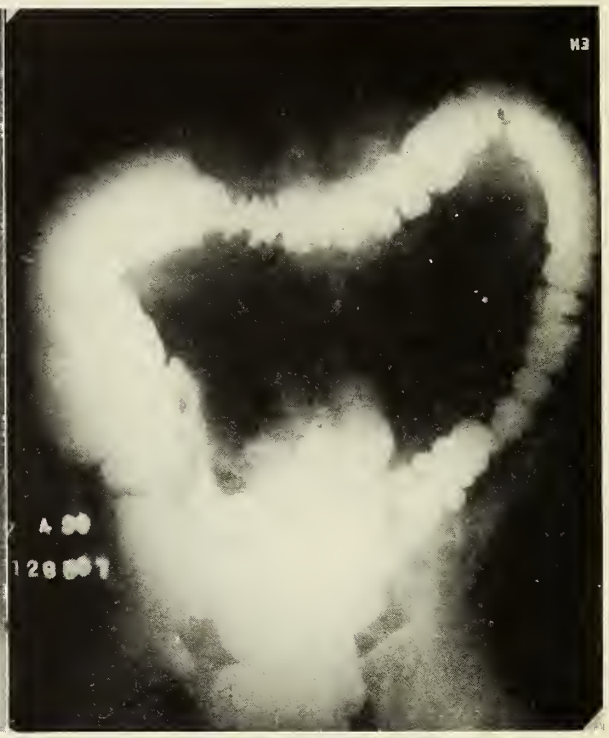


Fig. 2. Polypoid filling defect in distal part of descending colon. Adenocarcinomatous polyp (surgically substantiated).

In the second group, namely, that characterized by anemia, is one element which is outstanding as a symptom of carcinoma of the right half of the colon; that is, profound anemia, with concomitant change in the entire blood picture. This anemia is always unassociated with visible loss of blood and frequently may be called attention to by an attack of unexplained weakness or inability to carry on work; or it may be noted in the course of a general examination and may be without apparent cause. The exact explanation of this type of anemia is not clear, but it seems relatively certain that it is due to some perverted function of the mucous membrane which impairs it to such an extent that absorption of toxins results. The work of Whipple and Smith, Koons, and others, has called attention to this classical and almost pathognomonic picture. Sometimes the concentration of hemoglobin becomes as low as 25 per cent, and not infrequently I have been called on to attack surgical growths in the presence of a concentration of hemoglobin of 30 or 35 per cent. Characteristic of this also is the fact that these patients, with this blood picture, stand resection of the right half of the colon relatively favorably, indeed much more so than would a patient with the corresponding blood picture due to carcinoma of the stomach. So frequently does one find pro-

found anemia associated with growths of the right side of the colon that I am strongly of the opinion that no patients should receive a diagnosis of pernicious anemia until thorough examination of the entire colon has precluded the possibility of a malignant growth in the right half. It is an axiom that pernicious anemia should always be distinguished from anemia caused by carcinoma of the stomach, but I am confident, from my own experience, that there is far less likelihood of it being confused with gastric malignant growths than with colonic carcinoma.

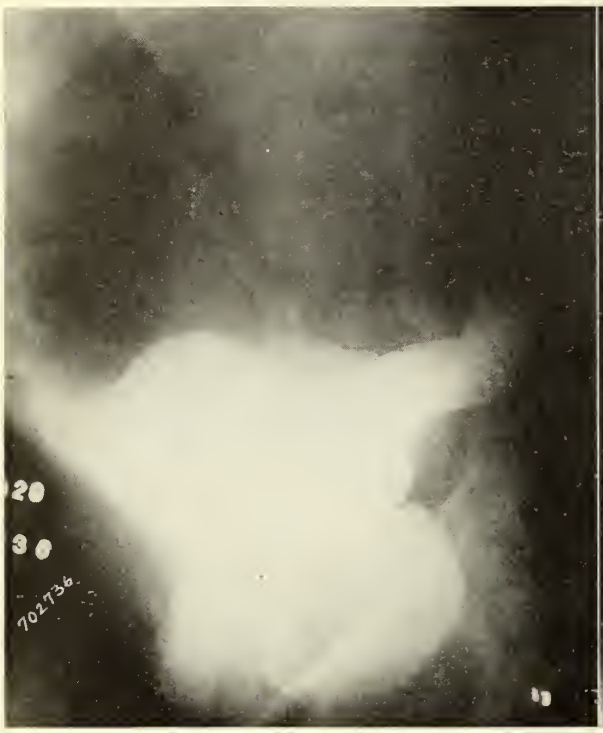


Fig. 3. Obstructing carcinoma of descending colon at level of the left iliac crest (surgically substantiated).



Fig. 4. Extensive filling defect in the cecum. Carcinoma (surgically substantiated).

Symptoms of malignant growths of the left half of the colon revolve around a syndrome of obstruction that is influenced by the scirrhous nature of the growths which have a tendency to encircle the bowel and to produce slow and progressive stenosis. Borborygmus and visual peristaltic movements are usually noted by most observers as being among the early symptoms. The borborygmus, associated with increased flatulence, may be accounted for by change in the intestinal contact, or it may be due to degeneration of the tumor or to obstructive changes which accompany stenosis. Visualization of peristaltic movement is possible only in lean persons or in persons in whom the contraction of the lumen of the bowel produces such obstruction to the fecal current and peristaltic wave as to produce proximal dilatation with increased stenosis. The effort of the bowel to force its content through the intestinal lumen may be observed more clearly, and occasionally a definite point of stoppage may be noted. In addition, the character of the fecal content of the left side is different; it is formed and hardened. To detect tumefaction in the left half of the colon is much more usual than to detect it in the right half, probably because of its greater accessibility, but more likely because of its obstructive nature which dams back the content of the bowel and produces dilatation and obstruction. Progressive constipation occurs in a high proportion of these cases, probably in between 25 and 40 per cent, and should call attention to the presence of some mechanical stenosis in the majority of cases before roentgenologic evidence is sought. It is difficult, however, to define in any person exactly what constipation is. The direct question as to the number of stools each day may or may not elicit this information accurately, for a patient

is frequently inclined to consider his bowel movements normal whereas he may have gone to stool many times a day and, in fact, pays little attention to the early intestinal irregularity, be it of the variety of diarrhea or of constipation. However, again let me emphasize that the change in intestinal habit is the most important early symptom of carcinoma anywhere of the large bowel. Chronic diarrhea in an elderly person frequently proves to be due to a malignant growth. If the growth is on the left, Moynihan's axiom is strikingly true: "In left colonic growths, constipation is the rule, while in right colonic growths, constipation is rare." The aphorism of Morison in this regard is as follows: "Increasing constipation of recent origin in an elderly person, only overcome by purgatives, suggests malignant disease of the colon." This obstruction may be either of the acute or chronic variety. If it is in the former division, it may be due to volvulus, intussusception, plugging of the lumen of the bowel by a foreign body or to swelling due to an inflammatory process superimposed on the malignant condition. The chronic form of obstruction occurs in the vast majority of cases of carcinoma of the colon, due to direct encroachment on the lumen of the bowel and dependent on the pathologic type and rapidity of the growth. In the splenic flexure, obstruction of a chronic or subacute variety is present in 100 per cent of the cases. Fortunately, carcinomas of the splenic flexure metastasize slowly because of the scarcity of local lymphatic drainage, and although they are frequently complicated by perforation and abscess, if one can attack them by the primary operation, the ultimate prognosis is satisfactory. Obstruction of the acute variety occurs in about 5 per cent of the cases and represents a most grave condition, in that acute intestinal obstruction is superimposed on an already fatal condition unless it is relieved surgically. This type of intestinal obstruction usually appears out of a clear sky, without premonitory symptoms, and the patient and surgeon are confronted by a grave state.



Fig. 5. Filling defect in distal part of ascending colon near the hepatic flexure. Carcinoma.



Fig. 6. Filling defect in proximal part of the ascending colon above the ileocecal valve. Carcinoma (surgically substantiated).

There are two symptoms of carcinoma of the colon which are commonly noted in textbooks, and which I wish to call attention to briefly. They are melena and tenesmus.

Tenesmus is noted in direct ratio of frequency as the growth approaches the rectal sphincter; that is, the lower down the growth, the greater the irregularity of the bowel and the more



Fig. 7. Rather extensive filling defect in proximal part of sigmoid. Carcinoma (surgically substantiated).

severe the straining at stool and tenesmus. It is an untrustworthy symptom of colonic disease and, unless the growth is within reach of the finger, rarely is present at all, save when a subacute or acute variety of intestinal obstruction has developed. Blood in the stool, on the other hand, is the most common symptom of growths in the lower left side of the colon or in the upper part of the rectum. I have little confidence in the presence or absence of occult blood in the stool as a diagnostic measure. Blood in the stool or on the stool is of importance unless its presence is explained away. If it is bright red blood and persists in the stool or on the stool, unquestionably there is a local lesion which is distal to the splenic flexure. Blood in the stool rarely is noted when the growth is in the right half of the colon, even by the more delicate tests for occult blood, and I distinctly wish to minimize its importance diagnostically except as far as it forces persons to have a complete gastro-intestinal examination.

The most important advance in the diagnosis of colonic malignant growths has been the tendency of roentgenologists to improve their technic to such an extent that accuracy of observation and of diagnosis is rapidly approaching the point at which it parallels the splendid information now universally obtainable by roentgenologic examination of the stomach and duodenum.

Characteristic roentgenologic evidence of malignant disease of the large bowel is so accurate that in 102 cases of carcinoma of the large bowel, beyond the sigmoid flexure, examined and proved by exploration at The Mayo Clinic in 1929, an error was made in only three cases. This is a remarkable and most satisfactory record, comparable to the best figures in any series of gastro-intestinal diagnosis. A filling defect, or visualized interference with the integrity of the lumen of the bowel, is so pronounced in the majority of instances in which accurate preparation has been made that experience with the fluoroscope promises to continue this accuracy. Certain nonmalignant lesions of the colon exhibit the same phenomena, but when carcinoma is the etiologic factor, certain pathognomonic features are present, and because of the constancy of the occurrence of this filling defect in a case of malignant disease of the colon and its typical characteristics, the roentgen ray offers the only objective, accurate preoperative diagnostic evidence at the disposal of physicians. The barium clysma, roentgenologically controlled, aided by palpatory manipulation and verified by roentgenography, is the method of choice for accurate detection of the situation of the filling defect and the precise interpretation of its characteristics. Although the defect shows on the roentgenographic films, it is much more desirable to make diagnoses fluoroscopically than to depend on the roentgenogram only. Occasionally, carcinoma causes complete obstruction to the barium enema, but usually one finds definite canalization which may be visualized. The rough, jagged contour of its margin, associated with the firm, knotty consistence of the mass, represent the cardinal differential characteristics. Generally speaking, the chief factor of error in roentgenoscopic diagnosis of colonic lesions is failure on the part of the

roentgenologist to procure adequate exposure of the involved loop of bowel. Strangely enough the sigmoid offers the most difficulty on this account because of its usually inaccessible situation in the bony pelvis and its frequently firm fixation by adhesions, usually of an inflammatory nature. Multiplication of anomalous coils likewise may complicate its visualization. Below the middle of the sigmoid, one should not depend on roentgenologic examination, but proctoscopic evidence is more easily and satisfactorily obtained. The right side of the colon imposes a peculiar difficulty to diagnosis by roentgenoscopy; its comparatively large lumen fails to show the striking degree of narrowing characteristic of the distal portion, and in the cecum particularly an extensive lesion may leave a large, rounded contour at its distal margin which may be misinterpreted as the tip of a normal cecum, in the absence of a definitely palpable tumor. Patience, diligence and care on the part of the examining roentgenologist, together with cooperation of the patient and clinician in securing the best possible preparation of the lumen of the bowel for examination, will aid materially in increasing the diagnostic evidences that are possible to elicit by the roentgenoscopic method.

To epitomize, then, the most important early symptoms of carcinoma in any portion of the colon are change in intestinal habit, as evidenced by irritability, mucous diarrhea, alternating periods of diarrhea and constipation, localized pain and tenderness without a tendency of them to disappear, tumefaction, profound anemia not accompanied by loss of blood, and obstruction of the acute, subacute or chronic variety. Given any of these suggestive phenomena, one should be urged to undergo immediately, at the hands of a competent roentgenologist, complete gastro-intestinal examination, with great assurance that the suspected lesion will be discovered. Let me add that loss of weight, cachexia, dehydration, and desiccation are not symptoms of carcinoma of the colon, but are symptoms of metastasis and impending dissolution, and to wait for such evidences to occur before suspecting a malignant condition and attempting to localize it by some means at hand is little short of being a party to fatal delay.

The prognosis in carcinoma of the large bowel, and the operative mortality, as compared with carcinoma of the stomach, impress one that with earlier diagnosis and more attention to preoperative and postoperative details, an increasingly large number of satisfactory three-year and five-year cures is being obtained.

At The Mayo Clinic it has been the custom recently to attempt to individualize patients with surgical conditions of the large bowel and rectum by segregating them into a group under the joint supervision of clinician and surgeon. This has resulted in the establishment of a routine preoperative preparatory stage which, in the majority of instances, has meant hospitalization, although with increasing experience we have come to recognize a distinct advantage in an ambulatory type of treatment for certain persons. The preoperative measures employed in this group of cases aim at (1) rehabilitation of the patient by decompression of the colon, and increase of the general resistance by introduction of large amounts of fluids, by blood transfusions and by other general hygienic measures; (2) insistence on a diet as free from residue as possible and consisting largely of carbohydrates, and (3) the use of an intraperitoneal vaccine (Figs. 1 to 7).

DISCUSSION

Dr. W. J. Mayo (Rochester): Mr. Chairman: One of my colleagues has said that the first thing to do in examining a patient is to examine the rectum so that you won't forget to do it, and to do it anyway, even if it does soil your hand. With a rubber finger cot or a rubber glove, and a little soap, one can make a clean examination of the rectum.

Patients with carcinoma of the rectum so frequently come to us too late, merely because the physicians in whose hands they have been have not examined the rectum thoroughly. If the patient is placed on his back, with the thighs drawn up, one can introduce the finger and reach high. It is true that one cannot reach up to the sigmoid juncture through the rectum, but one can reach the greater part of the rectum and by combined rectal, vaginal and abdominal manipulation, an excellent diagnosis usually can be made which the *x*-ray can verify.

Again, I would like to say just a word in regard to colostomy. When I first began practice, colostomy had just come in as a common operation, and any patient who had a carcinoma of the rectum had a colostomy made and that was about all. Many a patient with incurable carcinoma of the rectum who would have gone

on with his work for months, if he had not had the colostomy, at once was put into condition in which he no longer could work. It is very rare that a patient with carcinoma of the rectum below the rectosigmoid juncture will suffer from obstruction, and colostomy, except for obstruction, is not usually to be considered. Of course, colostomy as a preliminary to a radical removal of the growth and the rectum is a necessary procedure.

I am reminded of a little story that I read of a small boy who was studying physics. He was shown with books under his arm. He found the gardener pulling the wheelbarrow behind him, loaded with various implements. The little boy said: "Why do you pull the wheelbarrow from behind instead of pushing it in front?" The gardener said: "I hates the sight of it so." People hate the sight of a colostomy.

Again, in regard to those cases in which you perform exploration, remember that glands are often enlarged from sepsis in carcinoma of the rectum, without cancerous glandular involvement and sometimes in such cases colostomy is done, and nothing more, because such enlarged glands are supposed to be carcinomatous. Unless you are very certain, you had better take a gland out and have it examined microscopically for there are cases of cure after radical operation in which an enlarged gland was removed and did not prove to be carcinomatous.

One point more in regard to carcinomas of the rectum; that is removal of the carcinoma in a locally operable case in which secondary tumors are present in the liver. Patients with carcinoma of the rectum suffer dreadfully when the perirectal tissues, nerves and bladder are involved, but it sometimes happens that the metastasis is in some place in which it will not become septic, and in which the pressure on nerves will not be painful, and the patients may live for a long time. In such a case, if the growth is readily operable, in order to save the patient all of that suffering while he is waiting to die from metastasis, I never have hesitated to remove the rectum even in the presence of secondary growths in the liver or the lung.

It is astonishing how long such patients will sometimes live. I have removed comparatively small carcinomas of the rectum, when secondary nodules existed in the liver, and the patients have lived several years in comfort. If the primary carcinomatous growth is removed, the secondary growth may not progress so rapidly.

ATROPHY OF THE LIVER DUE TO CINCHOPHEN PREPARATIONS

When cinchophen was introduced into therapeutics (reinforced by the trade name "Atophan"—the tophi remover) its striking effect on the elimination of uric acid captured the clinical imagination. It was soon seen, however, that Atophan belied its name for the tophi refused to be removed. The drug was found, however, to be an effective analgesic. Various esters and derivatives were advertised extensively for the benefit of those who do not like the flavor of cinchophen and for the benefit of the manufacturers who could establish a monopoly on each little change. Cinchophen became a household remedy in the belief that it could do no harm. In 1923 evidence became available that the drug was causing fatal hepatitis. Since there are many other analgesics about as effective as cinchophen in many cases, and without this insidious danger, the use of the drug should be avoided whenever possible. Unfortunately, this is not simple, for a physician may be easily led into prescribing cinchophen when he does not know it. He may avoid it under the official names of cinchophen and neocinchophen or the original, therapeutically misinforming names of Atophan and Novatophan, but can he be expected to keep in mind all the noninforming names which manufacturers invent? This illustrates the importance of the rule of the Council on Pharmacy and Chemistry which permits not more than one trade name—that applied by the discoverer. The rule protects those that use New and Non-official Remedies but can do little for others. The case is even worse for the patent medicines that are advertised to the public. While physicians, now that they have been warned, will restrict the use of cinchophen and watch for the first signs of danger, cinchophen preparations may be sold to the public in mixtures of secret composition. (Jour. A. M. A., August 2, 1930, p. 345.)

THE EARLY DIAGNOSIS AND TREATMENT OF MALIGNANCY OF THE BREAST*

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Minneapolis

IT HAS long been known that any material reduction in the mortality rate from malignancy of the breast must come through earlier diagnosis and treatment, rather than through refinement of surgical or radiological technic.

For years the medical profession has been trying to impress upon the public the importance of routinely examining the breasts and promptly reporting to the physician any departure from the normal.

Viewed from the standpoint of ultimate results, particularly those obtained from the large general hospitals, this education has proven a disappointment. We are still being presented with too many late lesions.[18] Unsatisfactory results are attributable to unnecessary and preventable delay in receiving treatment. Lane-Clapon[23] found that out of 1,493 patients with cancer of the breast applying within three years of the onset of symptoms, only a little over one-half did so within six months. The mean alleged duration of symptoms was just under nine months. Of 1,447 cases with microscopic reports, 73 per cent had axillary metastases when operated. In a series of 111 cases from the University and Minneapolis General hospitals, the average duration of symptoms for those reporting within three years was nine and one-half months.

In contrast to this, a source of encouragement is to be derived from the increasingly greater number of women who are presenting themselves with few symptoms and minimal findings. McCarty, Sistrunk, Bloodgood, Floyd and Haggard, and others have noted this changing clinical picture and have attributed it to the cumulative effect of educational efforts. Whereas twenty years ago 80 per cent of presenting cases were malignant, now in most clinics, especially breast clinics, the great majority are benign.[6, 8]

With this increase in the number of patients having few symptoms and minimal findings, there has been a corresponding increase in the difficulty and the responsibility of the examining physician in correctly evaluating symptoms and advising the patient. This responsibility should be keenly felt when it is realized that, in its earliest and most curable form, malignancy presents few, if any, evidences of its presence.[12] It is a responsibility which cannot always be shifted to men especially trained to assume it, but must be accepted by the large group of practitioners. It is to this group of men that the following remarks are directed.

If one is to become proficient in the diagnosis of breast lesions, it is highly desirable that a system of examination be adopted and carried out routinely. The following commonly used method is recommended:

Without prejudicing his judgment by previous knowledge of the location of the lesion, the examiner has the patient remove her clothing to the waist and seat herself on a chair. Standing in front, he notes the relative size and weight of the two breasts, the presence or absence of dimpling of the skin, or retraction of the nipples. He inspects and palpates the supraclavicular region, noting the presence or absence of fullness and whether or not nodes can be felt.

The patient is then placed on a table with the head and shoulders slightly elevated and the hands locked behind the head. Standing at the head of the table, the examiner looks for tumor masses outlined in the breast or in the axilla, for the reddened eczematoid type of lesion of Paget's disease of the nipple, for dilated vessels beneath the skin, and for the "orange-peel" skin indicative of advanced malignancy.

The breasts are then systematically palpated against the chest wall with the flats of the fingers. Picking up the breast between thumb and fingers gives a false impression, as the normal breast lobulations then feel like tumor masses. Beginning with the periphery and finishing with the nipples, both breasts are palpated. The presence or absence of shotty or nodular areas, of definite solid or cystic tumor masses, is noted and, if present, recorded on a chart. The nipples are pulled for evidences of fixation and the areolar

*From the Department of Surgery, University of Minnesota, Minneapolis. Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1930.

area searched for worm-like masses produced by dilated ducts beneath the nipple.

Finding a definite tumor, its size, shape, and the sharpness of its margins are investigated. Its consistency is determined as nearly as possible, remembering that a tense cyst or a deeply placed cyst may feel like a solid tumor. Attachment to the pectoral fascia may be ascertained by having the patient press her clasped hands together across her chest to tense the pectoral muscles. By moving the tumor, early fixation to the pectoral fascia will be evidenced by restriction of mobility. Without fixation of the muscles, attachment of the tumor may be missed by motion of the muscle itself on the chest wall.

Early attachment to the skin can be demonstrated by puckering the skin around the tumor. This maneuver will produce dimpling over the most superficial and usually the hardest portion of the tumor.

Finally, the axilla and abdomen are palpated. Axillary lymph nodes are best felt by placing the patient's arm in partial abduction and inserting the finger tips to the apex of the axilla. Nodes are then felt to slip under the fingers as the hand is moved downward against the chest wall.

A relatively recent contribution to the technic of clinical examination is transillumination of the breast, as practiced and described by Cutler. A Cameron transilluminating electric lamp, which produces little heat, is placed underneath the breast. Inflammatory masses produce diffuse opacities which fade and disappear as the inflammation subsides. Solid tumors, benign and malignant, cast shadows depending on size and location; cysts filled with clear fluid are translucent. Traumatic hematomas cast dense shadows with fading margins. Intracystic or duct papillomas associated with a discharge of bloody fluid from the nipple present a uniformly circumscribed shadow. In cases with bleeding from the nipple where no tumor is palpable, the method is especially valuable in indicating the site of the lesion and determining whether there are multiple or single lesions. The method in itself does not differentiate malignant from benign lesions.

Having obtained all the available clinical information, the examining physician is ready to consider the diagnosis and method of treatment. He will be guided by two main considerations. First, every case of operable malignancy must have the complete radical amputation. Second, as many breasts as possible should be saved.

Cases group themselves into (1) the obviously malignant; (2) the obviously benign, and (3) the indefinite group. The obviously malignant, presenting one or more clinical signs of malignancy (attachment to nipple, skin or fascia, or metastases), offer no difficulty in diagnosis. They are not early lesions and do not come within the scope of this paper. Fitzwilliams[15] has said, "Anything that has any characteristic of malignancy I no longer regard as early." If the complete operation is done in all such cases, very few unnecessary removals of the breast will occur.

It is well to remember, however, that certain benign lesions may simulate malignancy. True mastitis, and traumatic fat necrosis, may become attached to the skin. Any benign tumor situated beneath the nipple may become attached and, finally, lymphadenopathy of other than malignant origin may simulate metastases. If any of the above mentioned are suspected, it would be advisable to treat the patient as one of the indefinite group.

The obviously benign group is increasing in relative number. The percentage of benign lesions for which operation is not indicated will vary with the experience of the examiner. Bloodgood recognizes and does not operate upon 65 per cent of cases; Bartlett places 46 per cent of cases in the obviously benign group as cystic disease and is constantly increasing the percentage of those who are not operated; Johnson considered 61 per cent as safe without operation. The man with little experience will do well to place more cases in the indefinite group. If any doubt exists, at the cost of a small scar the patient may be assured of maximum protection and the physician relieved of his uncertainty through microscopic diagnosis.

The third, or indefinite group, constituting, according to McCarty, about 25 per cent of the whole, presents the greatest difficulty. In dealing with this group, nothing is more illogical than the far too common practice of observing a tumor until such time as its malignant character manifests itself clinically. The development of clinical signs is due to extension or to metastasis of tumor tissue. To urge women to report their symptoms promptly, and then to procrastinate until they have lost their best op-

portunity for a cure, is a gross inconsistency and an inexcusable betrayal of trust.

The exploratory incision meets the requirement of accurate diagnosis at an early stage. With the patient prepared for the complete operation, the tumor or suspected area, together with a generous amount of surrounding breast tissue, is removed through a small incision. Immediate diagnosis is made by frozen sections. In the event of malignancy, the wound is cauterized to destroy any loose tumor cells, and the complete operation performed. There is no evidence that this procedure reduces the patient's chance of a cure. There is considerable evidence that a delay between the time of local excision and complete operation diminishes this chance. Harrington showed that there is a 5 per cent better prognosis over a five year period where no interval elapses. Unless an operator has the facilities for frozen tissue technic and access to the services of a competent pathologist, cases in this indefinite group should be referred elsewhere.

Let us now consider a rational course of procedure based upon the various clinical pictures most frequently found. Authors of extensive experience disagree widely in their attitudes on certain clinical pictures and pathological findings. The following represent the writer's conclusions in the light of his own and the accumulated experience of others.

Pain in itself is of little or no value in the differential diagnosis of malignancy.[3] It is common in early benign, rare in early malignant lesions. Its principal value is in calling the patient's attention to a lump in the breast, and in sending her to a physician.

Discharge from the nipple may occur in either benign or malignant lesions.[1, 14, 28, 29] It is not, as sometimes thought, diagnostic of malignancy. In the absence of clinical signs of malignancy, a tumor associated with discharge from the nipple should be excised for diagnosis. The majority of such lesions will be intracanalicular papillomas or cystadenomas, but a few will be malignant. In the absence of palpable tumor, transillumination will often reveal the duct and small tumor from which the bleeding is occurring. This area should also be excised for diagnosis.

Eczematoid lesions of the nipple associated with a tumor beneath indicates Paget's cancer of the breast and the radical operation should be performed.[9, 30]

In the absence of a palpable tumor, when the lesion on the nipple is very early, appearing more as an irritation, protective dressings may be applied in an effort to bring about healing.[7] If the effort is not entirely successful in three weeks, or if the lesion is well established at the outset, the nipple, areola, and a generous area of breast beneath should be excised and carefully examined for signs of cancer. In the absence of suspicious tumor in the duct region, no further operative procedure is indicated. The breast should thereafter be examined at frequent intervals.

Tumors in women under the age of twenty-five: Malignancy of the breast under the age of twenty-five is rare. If the dividing age be further reduced to twenty, there would seem to be no urgency in removing a tumor unless it is growing rapidly.[7] The most common single tumor occurring under the age of twenty-five is the encapsulated fibroadenoma. Fibroadenomas may undergo sarcomatous change. Later in life, complicating pregnancy, they may be wrongly diagnosed as carcinoma and cause the unnecessary loss of the breast. It is the writer's opinion that definite tumors are better removed. One should be very critical of the clinical signs of malignancy in patients under the age of twenty-five. In illustration of this point: A young woman presented herself at the University Hospital with a small hard tumor above the nipple zone and with enlarged hard glands in the axilla. On the basis of the rarity of carcinoma in her age group, a diagnosis of mastitis and tuberculosis of the axillary lymph nodes was made. Diagnostic exploration verified this original diagnosis and a breast with classical signs of malignancy was saved.

Tumors in women over the age of twenty-five: All single definite tumors in which the clinical signs of malignancy are absent should be removed and diagnosis immediately established by means of frozen sections. Such tumors will include various types of cancer, sarcoma, fibroadenomas, cysts of benign or malignant origin, localized areas of cystic disease, traumatic fat necrosis, and some inflammatory processes.

When inflammatory carcinoma of the breast is suspected, no operative procedure should be carried out. This type of cancer is so malignant

that surgery is contraindicated. Palliative *x*-ray treatment is all that can be offered.

The practice of aspirating a cyst to determine the character of the fluid is to be condemned on the grounds that cancer may exist in a cyst containing clear fluid.[2, 3]

Dilated ducts beneath the nipple, when bilateral and unassociated with definite tumor or retracted nipple, can be considered benign and kept under observation.

Multiple definite tumors, shotty or nodular breasts are usually manifestations of various types of cystic disease, commonly called chronic cystic mastitis.

Is cystic disease a precancerous lesion?

Evidence based on the microscopic examination of various types, particularly the adenocystic type in which epithelial hyperplasia predominates, has led many pathologists and surgeons to regard this disease as definitely precancerous and to recommend a simple amputation of the breast.[11, 15, 21]

Evidence based upon the follow-up of cases in which no operation, or local excision only, was performed, and in which over a period of years only the normal incidence of cancer occurred, has led others to consider the disease benign and to save the breasts.[5, 6, 7, 8]

In 1925 the writer, tracing cases from the records of the University Hospital and University Department of Pathology, found that no cancers had subsequently developed in cases for which no operation or local operation only for cystic disease had been performed. The writer feels that the rationale of treatment in cystic disease is based upon the difficulty in distinguishing between cystic disease and cancer rather than upon any predisposition to malignant change.

When both breasts are uniformly shotty or nodular, with no one area more definite and distinct than another, it would seem safe to forego operation. Mistaken diagnosis in such cases can do no real harm since bilateral diffuse cancer occurring simultaneously is incurable. Since cancer can occur in a breast containing diffuse cystic disease, any definite tumor present or arising in a diffuse indefinite process should be removed for frozen section diagnosis. Multiplicity of tumors is highly indicative of a benign process but does not rule out malignancy. The writer prefers to remove one or more of the most suspicious lumps. Since cancer developing in such a breast will more easily escape early detection, simple amputation might be justifiably recommended for older women, in whom the loss of the breast is less of a misfortune.

Without operation, unilateral and localized areas of cystic disease should be infrequently diagnosed by those with limited experience. The differentiation between infiltrating cancer mastitis and cystic disease is too uncertain without the aid of the microscope.

Along the line of technic, the writer desires to point out a commonly disregarded principle which was long ago advanced by pioneers in surgery of the breast, namely: the tumor should occupy the center of the block of tissue removed. A common error is that of making the incision to fit the breast rather than to fit the tumor.

In conclusion, those physicians who have not acquired a thorough knowledge of breast lesions and their proper management are urged to do so if they are to fulfill their obligation to the community and to the profession.

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MALIGNANT LESIONS OF THE KIDNEYS, BLADDER, PROSTATE GLAND AND TESTES*

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A CONSIDERATION of malignant lesions of the urogenital tract necessarily includes malignant tumors of the kidneys, bladder, testes, epididymis, spermatic cord and penis. Since it would be impossible to consider the malignant lesions involving all of these structures in one short paper, I am concentrating on the group of lesions which appear with greatest frequency; I refer particularly to malignant lesions of the prostate gland, kidneys and bladder.

I might first say, briefly, that tumors of the epididymis, spermatic cord and testicular tunics are, for the most part, benign (approximately 70 per cent). Malignant tumors in these situations are almost exclusively sarcomatous. The growth of most tumors of the spermatic cord is extremely slow. They are not painful and frequently the patient is not aware of their existence until trauma calls attention to them. Similarly malignant tumors of the testes are relatively rare. They constitute a proportion of only 5.8 in each 1,000 of all malignant tumors in men, according to the mortality statistics of the registration area of the United States. Of even greater rarity are malignant tumors of the epididymis; these are more of academic than of clinical significance. Tumors presenting themselves in these areas should be removed surgically. It has been the practice in The Mayo Clinic to supplement surgical extirpation of malignant tumors from these areas with the application of roentgen rays to the regional lymphatics. There are in the records of the clinic many cases in which patients with malignant testicular tumors, graded 4, are living and well three years or more after such treatment.

CARCINOMA OF THE PROSTATE GLAND

The most common cause of increase in size of the prostate gland is simple enlargement due to fibroadenomatous hypertrophy. The incidence of carcinoma of the prostate gland, compared with that of simple benign hypertrophy, is given by Thomson-Walker as 13.5 per cent, but in cases referred to the clinic, the relative proportion of benign to malignant lesions of the prostate gland is somewhat greater.

The diagnosis of carcinoma of the prostate gland can be made, in most cases, by palpation of the gland by rectum. Such a gland imparts to the palpating finger an impression of nodular induration or stony hardness, fixation, and frequently of extension of the growth to adjacent tissues. The last characteristic gives the gland an ill-defined margin. Occasionally chronic infection producing prostatitis will increase the consistence of the gland to the extent that one may suspect it to be carcinomatous. Similarly, prostatic calculi of small or large size may change the contour, configuration and consistence of the gland, so that the erroneous impression is gained that a malignant lesion exists.

The most common symptoms of carcinoma of the prostate gland are frequency of urination and perineal pain. In the latter stages of the disease, urinary obstruction may occur. The frequency with which small but diffuse carcinomatous glands metastasize to bone must be remembered, for occasionally such painful metastatic growths may be the first clues to the presence of prostatic carcinoma.

In a study of 1,000 cases of carcinoma of the prostate gland, in which treatment was carried out at the clinic prior to January, 1925, Bumpus found demonstrable metastasis in 24 per cent of the cases. The most common sites of the metastasis were regional as well as remote portions of the lymphatic system, whereas the next most common sites of metastasis were structures of the bony pelvis.

In a consideration of the treatment of malignant growths of the prostate gland, it should be remembered that there are two distinct clinical forms. In the primary type, the gland may be said to have been carcinomatous from the beginning of the change, whereas in the secondary type the characteristics are those of benign fibroadenomatous hypertrophy with secondary malignant changes. It is in the second group that surgical removal of the gland has given the best results. Cases in this group form no small per-

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centage of all cases of carcinoma of the prostate gland and their incidence has been reported by Albarran and Hallé to be 14 per cent and by Thomson-Walker to be 18 per cent among the cases of prostatic carcinoma seen by them. In a follow-up study of ninety-six cases in which prostatectomy was performed and in which malignant portions were found on examination of the gland, Thomson-Walker reported that malignant growth had recurred in only 3 per cent.

It has been the custom at the clinic to advise and to carry through prostatectomy, either by the suprapubic or perineal routes, in cases of prostatic enlargement due to carcinoma whenever there has been sufficient evidence that the carcinomatous process has not extended too widely beyond the periphery of the gland. This of course automatically eliminates from consideration for prostatectomy any cases in which metastasis has occurred. On a few occasions a gland which had the appearance of being the site of early carcinomatous enlargement, when removed proved to be affected by simple prostatitis or prostatitis with calculi. In other cases, particularly in cases of carcinoma of the primary type, removal of the obstructing portion of the gland, although it does not completely remove the carcinoma, often will relieve urinary obstruction and dysuria for months, and sometimes for years, before cystostomy becomes necessary. In cases of unremovable carcinomas of the prostate gland, permanent suprapubic cystostomy not only serves to relieve the urinary obstruction but may furnish the patient many months of comfortable life. It may or may not be combined with treatment by radium, but in our experience it has been difficult to evaluate the effect of radium in such cases. In many cases of carcinoma of the prostate gland the only symptom is perineal pain. The value of roentgen rays applied through the perineum, as a method of relieving some of these patients of their perineal pain, should be stressed. However, if relief is not obtained, extirpation of the hypogastric ganglia, as suggested by Learmonth, is worthy of consideration.

In an evaluation of the results of treatment for malignant disease, the characteristics of the malignant lesion, its situation, its rapidity of growth, its extension into surrounding structures, and its tendency to metastasize, must be considered. In the treatment of malignant disease of a given situation, one should be concerned not only with the desire completely to eradicate the malignant process but also should be on the alert to remove or destroy recurrences at an early time and to relieve obstruction and pain.

It is to be expected that in patients with primary carcinoma of the prostate gland, life will not be prolonged as much as in cases of secondary involvement. Yet, even in inoperable cases, the relief of urinary obstruction by introduction of a suprapubic cystostomy tube is of distinct benefit to the patient. Besides, there is an occasional suitable case in this group in which operative removal of the gland will be followed by good results. Of 164 patients with carcinoma of the prostate gland, who were operated on at the clinic, and concerning whom records are available, Bumpus found that thirty-five were still alive in 1925 and that twenty-one of them had lived longer than five years. The best results following enucleation of the carcinomatous prostate gland will be in the cases of so-called secondary carcinoma, if metastasis has not occurred. In a study of sixty-six cases, in each of which a prostate gland with malignant portions was enucleated, Thomson-Walker found evidence of recurrence of the carcinoma in only 3 per cent. Much depends on the proper selection of cases for the various procedures. Experience in handling such cases will aid in making choice of the best method of attack.

MALIGNANT TUMORS OF THE KIDNEYS

Adenocarcinoma or hypernephroma constitutes practically all malignant tumors of the kidney, with the exception of the primary squamous-cell epithelioma of the pelvis of the kidney, which in proportion to the adenocarcinomas exists in the relation of from 1:11 to 1:14.

Sarcoma of the kidney is relatively rare. In an unselected group of 225 cases of malignant tumor of the kidney in which operation was performed at the clinic, only ten of the tumors were sarcomas. The assumption that sarcoma of the kidney occurs chiefly in young adults has not been borne out in our experience. For example, eight of ten patients with sarcoma of the kidney were adults, whereas the tumors in a series of thirteen children with malignant tumors of the kidney were reported by the pathologist as adenocarcinoma, sarcoma and Wilms' tumor.

Lumbar pain, the presence of a tumor in the region of the kidney and hematuria are the triad

of symptoms present in practically all cases of malignant tumor of the kidney. In a group of 367 cases of carcinoma of the renal cortex reported at the clinic by Judd and Hand, one of these symptoms was present in 99 per cent.

Adenocarcinoma of the kidney is associated with tortuous, dilated veins in the fatty capsule surrounding the lesion. In the early stages, adenocarcinoma is limited to the poles of the kidney and as the lesion extends by growth the entire kidney may be involved. Later, the capsule may be broken through and the perirenal tissues become involved, extension sometimes occurring into the renal veins. When metastasis occurs, it involves the lungs, the lymph nodes, the liver, the skeleton, the brain, the spinal cord and the pleura, in decreasing frequency in the order named.

In 192 cases of malignant tumor of the kidney in which nephrectomy was performed, the average duration of symptoms before operation varied from seventeen to twenty-one and a half months. Ninety-one of the 192 patients on whom nephrectomy was performed are still living, and yet the average duration of their symptoms before operation varied from thirty to forty months. In a series of 250 cases in which nephrectomy was performed for adenocarcinoma of the kidney at the clinic, twenty-six patients have lived ten years or more. The association of lumbar pain, enlargement of the kidney and hematuria in more than 99 per cent of cases of malignant tumor of the kidney, and the fact that the duration of life and the completeness of cure are proportionate to the degree of malignancy and the size of the malignant lesion of the kidney should serve as a plea for earlier diagnosis and treatment of this lesion after conclusive proof of its existence has been established.

It is probably unnecessary to emphasize the absolute necessity of cystoscopic examination of patients with hematuria. In the presence of such a history, the burden of proof that a malignant tumor is or is not present in the bladder or in the kidneys lies directly on the examining physician, and the only accurate method of determining or of eliminating these possibilities is by cystoscopic examination and the other refinements of urologic diagnosis, such as pyelography. If there is a question with regard to the nature of the lesion in the bladder, a specimen should be removed for microscopic diagnosis at the time of the cystoscopic examination.

I am observing a patient in the hospital at the present time whose condition illustrates the foregoing points. The patient had been in perfect health until two months ago, when he noticed gross hematuria on two occasions. Subsequently, the urine became clear, although a few erythrocytes were found in the urinary sediment on microscopic examination. Cystoscopic examination revealed a normal appearing bladder. A pyelogram of the right kidney was negative, and that of the left showed obstruction at the ureteropelvic juncture. Exploration of the left kidney was advised and after a great deal of persuasion because of the absence of symptoms, with the exception of hematuria, and his opinion that he was in excellent health, the patient gave his consent for operation. The interior of the kidney was filled with papillary squamous-cell epithelioma, which was confined entirely to the pelvis and calices, and nephro-ureterectomy was done. The prospects for permanent cure in this case are excellent, due to the early recognition of abnormality in the kidney and the complete removal of the kidney as well as the path of the extension of the papillary squamous-cell epithelioma down the mucous membrane of the ureter.

Papillary squamous-cell epitheliomas of the renal pelvis are relatively uncommon as compared with the solitary cortical tumors, as has been previously stated. Squamous-cell epitheliomas differ in degree of malignancy, as do all malignant tumors. The degree of malignancy may be accurately determined by Broders' index. The tendency of papillary epithelioma in the renal pelvis to extend directly along the mucous membrane of the ureter to the bladder necessitates ureterectomy at the time or soon after the removal of the affected kidney. This tendency of direct extension down the ureter, rather than metastasis to distant structures or invasion of perirenal tissues, makes papillary epithelioma of the renal pelvis less malignant than the cortical tumors, degree for degree.

In summarizing this brief consideration of malignant renal tumors, I wish to emphasize again the truly excellent results which have followed nephrectomy. Quoting again from the statistics of the clinic as summarized by Judd and Hand in a group of 283 unselected cases of

malignant tumor of the kidney in which nephrectomy was performed, in 106 cases the patients lived from three to twenty-two years, whereas ninety-one patients (almost 33 per cent) are living and well an average of more than five years after operation.

It has been found difficult in the clinic to estimate the value of roentgen rays and radium, or both, as additional aids to surgery, since these are agents used only in cases in which there is extensive involvement of the perirenal tissues and in which it is felt that all of the tumorous tissue has not been removed.

MALIGNANT TUMORS OF THE BLADDER

Epitheliomas comprise approximately 95 per cent of the lesions of the bladder. They vary in degree of malignancy (grades 1 to 4). The most common symptom of a malignant tumor of the bladder is hematuria, although frequency of urination and dysuria may lead the patient to seek diagnosis before gross hematuria is noted. The necessity for a cystoscopic examination, the elimination of the kidneys as the source of the bleeding and the removal of a specimen from a suspected lesion for microscopic examination are obvious. Methods of treating malignant tumors of the bladder should depend on their relative degree of malignancy, their size and their situation. Most tumors of the dome or lateral and posterior walls of the bladder are operable and lend themselves readily to excision or resection. If a lesion situated in one of these areas is of a high degree of malignancy, that is, graded 3 or 4, and is infiltrating, segmental resection is indicated of that portion of the bladder and also of the normal portion of the bladder for a distance of at least 1 cm. at the periphery of the growth. On the other hand, tumors of lower degree of malignancy often lend themselves to local excision or, if of small size, to electrocoagulation through the cystoscope. Tumors in the base of the bladder are usually not resectable because of involvement of one or both ureters. Lesions of a low degree of malignancy involving this area can many times be completely and permanently eradicated by the employment of the actual cautery or by electrocoagulation. Bumpus reported a series of thirty-six cases in which extensive inoperable tumors of the bladder involving the base and the ureteral orifices were destroyed by cautery; seven patients in this series have lived for more than four years and one has lived for nine years. There is no doubt of the value of the transvesical electrocoagulation of tumors involving the base of the bladder, especially if they are highly malignant.

In a group of fifty-one cases of this type with involvement of one or both ureteral orifices or the internal urethral orifice, twenty-two patients have remained free from recurrence from six months to more than three years. Comparable results in similar cases by electrocoagulation were reported in the symposium of tumors of the bladder by Kretschmer at the 1930 meeting of the American Medical Association.

The tendency of malignant tumors of the base of the bladder to obstruct the ureteral orifices, with resulting degeneration of the renal parenchyma, has led to a critical estimation of the value of external ureterostomy, bilateral nephrostomy or ureteral transplantation into the sigmoid. The excellent results obtained by the transperitoneal method of ureteral transplantation into the sigmoid at low operative risk by the C. H. Mayo method in cases of exstrophy of the bladder, the bilateral simultaneous ureterosigmoidal implantation described by Coffey, and the extraperitoneal transplantation of Cabot have reawakened interest in this method of treating extensive inoperable tumors involving the base of the bladder which have not responded to direct methods of attack. After the transplantation of the ureters in these cases, the use of massive doses of radium or of complete cystectomy offers the possibility of cure of the malignant disease, provided metastasis to the regional lymph nodes has not occurred, and at least offers relief from the distressing dysuria and hematuria for which patients seek relief.

Small tumors of the bladder of a low degree of malignancy are often best treated by electrocoagulation through the cystoscope. If the tumor is highly malignant and not large, transurethral electrocoagulation can often be done satisfactorily for it has been frequently demonstrated that malignant cells cannot withstand abnormally high degrees of heat.

Following the treatment of the malignant lesions of the bladder, patients should be ex-

amined at regular intervals, usually every three months the first year and every six months the second, to determine whether or not the tumor has recurred. This can only be determined by cystoscopic examination. Such recurrence or extension of the tumor usually occurs in the form of small implants and can be easily destroyed by electrocoagulation carried on through the cystoscope.

The results of treatment of epithelioma of the bladder in which curative surgical measures were carried out in the clinic in 370 cases have been summarized by Hunt. The study indicated that results are dependent on the site of the tumor, its extent, and the degree of malignancy. In cases in which the malignant lesions were graded 1 or 2, and in which the lateral walls of the dome were involved, 73 per cent of patients were living and well three or more years after operation, whereas 50 per cent of patients with tumors involving the base of the bladder of similar degree of malignancy had been without recurrence for a similar period. In cases of the most malignant tumors, graded 3 or 4, there is proportionate or corresponding decrease in good results of treatment. In 42 per cent of cases in which the tumors were graded 3 or 4 and in which the lateral walls of the dome were involved and in 25 per cent of cases of corresponding degrees of malignancy in which the base of the bladder was involved, the patients have been without recurrence for a period of more than three years.

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DISCUSSION ON SYMPOSIUM ON THE DIAGNOSIS AND TREATMENT OF CANCER

DR. W. J. MAYO (Rochester, Minn.): We think of cancer in connection with man, but all living things, plant and animal, suffer from analogous conditions at some point in the bodily structure at which their condition of life or habits interferes with the protective mechanism. The late Dr. Erwin Smith, in the Department of Agriculture at Washington, made a life study of plant cancer and discovered certain microörganisms which appeared to be its cause, or which at least prepared a field for its development. The theory that cancer in man was due to a microörganism which entered the human body at some point of local lesion was at one time very popular and many supposed germs, bacterial or protozoa, were discovered. This theory, on further investigation, was discarded. If parasitic agents are the cause of cancer, why, for instance, are metastatic growths in the liver from cancer of the stomach, not cancer of the liver? As a matter of fact, they are cancers of the stomach in the liver. Obviously the diseased cell from the original tumor has been transplanted to the liver.

In a consideration of the development of cancer, three facts are closely related: (1) a local point of origin; cancer never appears in sound tissue, (2) there is a change in the cells of the part affected, and (3) a striking variation in the susceptibility of persons to the development of cancer; in some, under no conditions, will the disease develop; in others, it appears on the slightest provocation. In relation to this third fact our ultimate hope is that some method may be evolved whereby low resistance may be raised to high resistance, or even immunity may be established.

The local lesions in which the effectiveness of the bodily protection has been reduced, fall into three types: (1) small tumors, moles and warts, and neoplasms which are not originally cancer but may become so; (2) injuries (sarcoma often follows on the site of a contusion), and (3) most common, chronic irritation.

Investigation of the various theories of the causation of cancer shows that the one provocative agent which remains unchallenged is chronic irritation. In all lands, among all peoples, we see this one causative influence in the ascendant. In China, among those who shave their heads with a dull and rough-edged razor, cancer of the scalp is common, but does not occur among those who do not shave the scalp. The Chinese men eat at the first table, when the rice is hot, throwing it with some force by means of chopsticks into the mouth and pharynx, and not infrequently they suffer from cancer of the pharynx and of the beginning of the esophagus. The women, who eat at the second table, when the rice is cold, seldom have the disease. In Australia the sharp-edged sand in the desert portion of the country, blown by the hot wind, so frequently produces cancers of the skin of the face that such cancers are called the "Australian disease." In certain parts of India and the Philippines, where the betel nut, wrapped in its leaf with lime, is chewed, cancer of the mucous membrane of the cheek is still common. Among smokers, cancer of the lip sometimes develops, less commonly since heat-conducting clay pipes are no longer used. Cancer of the gums and about the teeth is less common now that by modern methods of dentistry irritating stumps and roots may be removed. Cancer of the breast occurs largely among civilized women. In those countries in which the breasts are allowed to be exposed, that is, are not compressed or irritated by covering, it is rare. In the mountain regions of Kasmir, India, where the people carry braziers filled with hot coals strapped onto the lower part of the abdomen, in going from the valleys into the cold mountains, cancer just above the pubes is common.

With improvements in construction of buildings and changes in fuel, there are no longer many chimneys which require cleaning, so that chimney-sweep's cancer of the groin is less common, but we still see an occasional cutaneous epithelioma on the shins of railroad engineers and firemen whose legs have been exposed during years to the intense heat of the engine firebox.

I have merely touched on those few outstanding examples of cancer of visible parts of the body about which there is little dispute. As to cancer of the interior of the body we have less definite proof. Cancer in the internal protective mechanism of the body is encouraged by injuries to the local protective mechanism. Cancerous gallbladders usually contain stones. Gallstones are three times as common in women as in men, and cancer of the gallbladder is found in about the same proportion.

That ulcer of the stomach or some analogous condition may be responsible for cancer of the stomach is admitted by all, although there are great differences of opinion as to the frequency of cancer from this cause. Hurst has given statistics to show that in about 20 per cent of cases of ulcer of the stomach, cancer may be expected. In our experience, although the percentage in which the histologic examination of excised cancers of the stomach for evidence of preceding ulcer varies in different series of cases, evidence of the development of gastric cancer on some type of demonstrable precancerous disease, such as ulcer, is present in more than 25 per cent. Ulcer of the stomach will be revealed by a considerable percentage of resections for cancer of the stomach.

Cancer of the stomach is rather rare in uncivilized races and in animals. It is the base of nearly a third of the total number of cancers of civilized man, and perhaps taking foods and fluids too hot, hotter than can be held comfortably in the mouth, may have something to do with this.

Cancer of the ovaries is common, and cancer of the testis is uncommon. The testis is the primitive organ from which the ovary is derived, and has a greater resistance than the ovary, just as the small intestine, by reason of its primitive character, has greater resistance than the large intestine and rectum.

Both the uterus and the breasts are most likely to undergo cancerous change at about the period of meno-

pause, indicating that the age of senile cells acts as an invitation to the disease.

As bearing on the question of heredity and susceptibility, it is interesting that although there is great variation as to the organs affected, in the statistics from various civilized countries, the total percentage of those who have cancer for the same age periods is about the same.

In thinking of cancer we must keep clearly in mind the distinction between a local lesion which may undergo malignant change, but which is as yet without cellular alteration, and those conditions which we speak of as "precancerous," in which cellular changes have taken place, but which have not invaded the surrounding tissues in characteristic fashion.

The lesson that is to be learned is that local lesions which give opportunity for cancer are to be cared for early, that precancerous lesions are to be taken care of skillfully, and that treatment of early cancer either by the knife or radioactive agents, alone or combined, gives a high percentage of cures (79+ per cent).

In conclusion, I will touch on the fear of cancer which is so prevalent as frequently to cause patients to delay examination of a tumor or suspicious area because they believe that cancer is incurable. Of patients operated on before metastasis has taken place, nearly 80 per cent are cured permanently. Unfortunately the man who has been cured of cancer conceals the fact as he would a prison sentence, because he understands that it would interfere with his future advancement, whereas those who seek medical aid too late cannot conceal their condition, and therefore the laity form an exaggerated idea of the hopelessness of the disease.

Dr. E. Starr Judd (President-elect, American Medical Association): Mr. President and members of the Minnesota State Medical Association: I have been very much interested in this symposium on carcinoma.

The first paper I heard was that by Dr. Campbell, and I think that he brought out the most important points in the early diagnosis of carcinoma of the breast. We have long realized in the clinic that if we found a tumor of the breast to be attached to mammary glandular tissue or to the skin that this finding established the diagnosis of carcinoma and Dr. Campbell has brought this out especially well today.

If one looks back in the old textbooks, or in some of the modern ones, he will find that serosanguineous discharge from the nipple is considered to be a positive sign of carcinoma of the breast. Dr. Dean Lewis called our attention to the fact that unless this symptom is associated with a tumor of the breast, carcinoma probably is not present. In other words, if there is tumor of the breast, and bleeding from the nipple, carcinoma is probably present; if there is no tumor in the breast in the presence of bleeding or serosanguineous discharge from the nipple, then the condition is more likely to be due to intracanalicular papilloma, which is practically always benign, or else it is due to chronic cystic mastitis.

There are two points in Dr. Walters' paper that I want to mention. One regards tumors of the testis. All of the tumors of the testis for which I have operated have been of the Ewing type. Ewing called attention several years ago to the fact that all tumors of the testis are really teratomatous, or mixed-cell tumors. Some of them are predominately sarcomatous; that is, connective tissue elements predominate. In others, endothelial cells predominate. All of these tumors are malignant. They metastasize to the lymph nodes in the retroperitoneal region. It is not necessary to perform radical removal of the cord and the retroperitoneal lymph nodes. Removal of the testis, followed by roentgen therapy over the posterior lymph nodes, frequently will give eight to ten years of comfort. Some patients seem to have been cured. If there is recurrence of the testicular malignancy in the retroperitoneal lymph nodes, it will frequently respond to treatment by roentgen rays and the patients can be made comfortable for a long time.

The other subject I want to discuss in Dr. Walters' paper is carcinoma of the prostate gland. I think that we owe a great deal to the late Dr. Geraughty, who was a St. Paul boy and who worked in the Brady Institute. He added much to our knowledge of the pathologic changes in the prostate gland. Carcinoma of the prostate gland invariably originates in the posterior lobe. In association with the carcinoma there may be adenomatous hypertrophy. Besides doing as Dr. Walters recommended, I think suprapubic cystostomy and removal of the benign adenomatous hypertrophic tissue frequently will enable the patients to urinate and to get along fairly well for a number of years.

THE EFFECT OF LIVER AND LIVER EXTRACT UPON THE SYMPTOMS AND SIGNS REFERABLE TO THE NERVOUS SYSTEM IN PERNICIOUS ANEMIA*

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LESIONS of the central nervous system are extremely common, in pernicious anemia, occurring, for instance, in Waltman's series of 150 cases in something over 80 per cent. They lead to serious effects which often incapacitate the patient or actually endanger his life.

A matter of great importance in the treatment of pernicious anemia by liver, as developed by Murphy and Minot, is the effect of this treatment on the combined degeneration of the spinal cord or funicular myelitis or myelosis, as Henneberg calls it. During the last few years many reports have been published on the subject but it is possible to refer to only a few at this time.

Minot suggested in the first report on the treatment of his 105 cases that the nervous symptoms might improve. Others, such as Sturgis and Isaacs, Ordway and Gorham, McAlpine, and especially Syderhelm are pessimistic. Syderhelm goes so far as to say that the liver diet has no effect on the symptoms referable to the combined degeneration, and that in spite of relief from anemia the disease progresses to a pernicious myeloencephalotoxicosis.

There are, however, an increasing number of reports in the literature which show that remarkable or even phenomenal improvement may take place both in the symptoms and signs referable to the lesions in the nervous system. One of the most striking cases has been reported by Bubert. Schilling, reviewing his eighty cases of pernicious anemia treated by liver, states without details, that improvement in nervous symptoms frequently occurred. A careful study has been published by Ungley and Suzman in Brain for September, 1929. They review sixty-one cases of pernicious anemia, all of which showed nervous symptoms and 30 of which were treated by liver. In 63.9 per cent the first symptom was referable to the nervous system. I shall not recount the various symptoms and signs in their series, but be content with the statement that the symptoms were referable to lesions in the posterior columns, the lateral pyramid tracts or to combined degenerations. Of the thirty patients treated with liver, seventeen improved, eight were unimproved and five died. Of the thirty-one patients that were not treated by liver, three were unimproved and twenty-eight died. Eight of the seventeen patients that improved are at work. Numbness and tingling present in all thirty cases disappeared completely in ten. Girdle sensation disappeared; incoördination and ataxia disappeared in ten cases. Changes in cutaneous sensation, present in twelve, became normal in eight. Astereognosis, present in two, disappeared in one. The knee jerks remained unchanged. Babinski reactions, present in nine, disappeared in five. Disturbances of micturition, present in seven, disappeared in six. These, we think, are the most encouraging figures published up to the present time, although by McAlpin they are considered optimistic.

We can summarize briefly the results that we have observed in forty-four cases of pernicious anemia with nervous symptoms, treated by liver and liver extract.

Among these forty-four cases, there were examples of practically all of the common symptoms and signs referable to the nervous system in pernicious anemia; and in addition some manifestations that are decidedly rare.

Numbness and tingling occurred in thirty-five, absent or diminished vibratory sense in thirty-three, weakness in forty-five, ataxia in twenty, Romberg's sign in fifteen, spasticity in nine, hyperreflexia in seven, hyporeflexia in nine, plantar extension in ten, disturbed cutaneous sensibility in eight, sphincter disturbance in seven, psychic disturbances in eight, loss of potentia in five, paralysis of the diaphraghm in one.

Though all of the patients have been treated

*From the Department of Medicine of the Johns Hopkins University, School of Medicine, Baltimore. Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

with liver, or a combination of liver and liver extract in large amounts, it has not been possible to follow all of them accurately, or for a sufficient period of time, to determine what result the treatment may have had; for the duration of treatment has seemed to us of great importance as affecting the continued and satisfactory improvement of symptoms.

For convenience we have considered the results of treatment in three groups of cases. The first group comprises those cases that have been treated by liver or liver extract for less than six months; the second group comprises those cases that have been treated for more than six months; and the third group comprises eight cases of outspoken combined degeneration that have been treated for ten months.

In the first group there were twenty-one patients who were treated for less than six months. Exclusive of improvement in weakness, an observed improvement took place in the signs and symptoms in 31.25 per cent. In the second group, comprising the patients that were treated for more than six months, there were twenty-three cases. In this group, improvement in both the nervous symptoms and the signs referable to involvement of the nervous system was more frequent and occurred in 55.17 per cent. In the third group, consisting of the eight cases of outspoken subacute combined degeneration which were treated for more than ten months, the improvement was frequently remarkable and occurred, according to symptoms and signs, in 58.93 per cent.

The definite improvement or disappearance of such objective signs as spasticity, plantar extension and changes in cutaneous sensibility which occurred frequently in these groups of cases must lead to the conclusion that some regression has taken place in the lesions affecting the nervous system.

Another point which has impressed us is the rapid return of symptoms and signs when the liver is reduced or is actually omitted from the diet. This has occurred in several instances, and we have noted a second period of improvement when proper amounts of liver were added to the diet. We have further observed the most favorable results in those patients who have conscientiously consumed large quantities of liver and liver extract daily. We have thought that 400 grams of liver daily, or its equivalent, was essential, and many patients have taken more. Furthermore, the patients whose blood counts have remained above or about 5,000,000 are the ones who have shown the most pronounced and the most continuous improvement.

When one considers the results of treatment by liver obtained in such a series of patients, it becomes evident that the changes in the central nervous system in pernicious anemia are not always irreparable. This seems to be true, even though the symptoms and signs have been present for weeks, or sometimes months, before treatment is instituted. We know now, as Henneberg has pointed out, that the lesion is not a sclerosis but a focal degeneration of the myelin sheath or of the axone which, as the process increases, spreads upwards in the posterior column and down in the pyramidal tracts. According to Henneberg, the lesion is different from that in tabes, inasmuch as the posterior roots are not involved. An increase in glia fibers, such as one sees in multiple sclerosis, does not occur; and all authorities are now agreed that the lesion is entirely of a degenerative nature.

There is still dispute as to whether the axis cylinder or the myelin sheath is first involved. There is also considerable evidence being accumulated to show that the lesions are by no means confined to the spinal cord. A few cases have been described in which anatomical lesions were found in the peripheral nerves and brain. Mathieu, reporting a case of pernicious anemia showing changes both in the peripheral nerves and spinal cord, suggests that the weakness and alterations in cutaneous sensibility may, in many cases, be due to peripheral neuritis. McAlpine, in discussing the matter recently, has called particular attention to certain symptoms and signs affecting the cutaneous sensations and reflexes that can be best explained as due to peripheral neuritis. It has further been suggested that the process is somewhat analogous to beri-beri and to pellagra, in which degenerative lesions have been observed in the spinal cord as well as in the peripheral nerves. Psychoses, usually manifested by depression, and ideas of persecution are not uncommon in pernicious anemia, and occurred in a fair proportion of

our cases. A view, therefore, which is rapidly becoming prevalent is that, in pernicious anemia, all parts of the nervous system may be affected, peripheral nerves, cord and brain.

One view as to the cause of these lesions, which has recently been advanced, is that the changes in the nervous system are dependent, as they are in beri-beri, upon a vitamine deficiency. Indeed, as one studies these cases of pernicious anemia, as well as the cases of sprue, it seems more and more probable that the defect which brings about the symptoms is analogous to a vitamine deficiency, or at least some deficiency which is supplied by liver or liver extract, by meat digested with normal gastric juice, or by the normal gastric mucosa of such animals as the pig. It is known that the immediate cause of beri-beri, and probably of pellagra, is a deficiency of vitamine B, and it has been shown further by Cogwill and by Gilder, Kattwinkel and Castle that lack of the anti-neuritic principle of vitamine B in the diet will result in extensive multiple degenerations of the peripheral nerves, spinal cord and brain, in dogs. These experiments suggested to them that, in some way vitamine B deficiency might be accountable for the alterations in the nervous system in pernicious anemia. We have been told, indeed, that for many years some practitioners have used yeast in the treatment of their cases of pernicious anemia with nervous symptoms. Recently, however, we have seen one such case in which yeast had been substituted for a time for liver, but with rapid progression of the nervous symptoms.

It seems, therefore, that there is considerable evidence to show that, in pernicious anemia, acute degenerations may occur not only in the spinal cord but in the peripheral nerves and brain; and, though these are analogous to the changes occurring in beri-beri and other forms of vitamine deficiences, there is no direct evidence to indicate that vitamine B deficiency is the cause of the lesions in pernicious anemia. It has, however, been amply demonstrated that large amounts of liver, administered over long periods of time, will bring about remarkable improvement in the symptoms and signs referable to the lesions in the nervous system in pernicious anemia.

CONCLUSION

Forty-four cases of pernicious anemia, in which there were symptoms referable to changes in the central nervous system, have been treated by liver or a combination of liver and liver extract.

Of twenty-three cases followed for more than six months, improvement in symptoms and signs has occurred in 55.17 per cent. In twenty-one cases treated for less than six months, improvement was noticed in only 31.25 per cent. In eight cases of outspoken combined degeneration, treated for more than ten months, there was improvement of symptoms and signs in 58.9 per cent.

It is essential that large quantities of liver, or liver and liver extract, be employed over long periods of time.

When the amount of liver is much reduced, or dispensed with, relapses may occur promptly.

It seems probable that in pernicious anemia the myelin degeneration may occur in the peripheral nerves and brain, as well as in the spinal cord, and that some of the symptoms and signs which undergo improvement are referable to a peripheral neuritis.

THE TREATMENT OF PSORIASIS VULGARIS WITH INTRAVENOUS ADMINISTRATION OF ACRIFLAVINE*

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IN 1928 Professor M. Oppenheim of Vienna reported the successful treatment of psoriasis with intravenous injections of trypaflavine combined with ultraviolet irradiation. Injections of this dye, an aniline derivative (acriflavine hydrochloride), were shown to have a strong photosensitizing effect, and were given as a means of increasing the value of the actinic rays.

The following year through the courtesy of Dr. J. S. Biehn of the Abbott Laboratories we were furnished with a purified neutral acriflavine suitable for intravenous use. Later, because of the toxicity of the neutral salt, this was replaced by an acid acriflavine.

Twenty patients were selected for treatment from the out-patient departments of the Minneapolis General and the University Hospitals. All were unquestionable cases of psoriasis of the subacute or chronic type. Most of the patients had already been under our observation for some time, and all had received other therapeutic measures in the past. The series included twelve males and eight females between the ages of eighteen and fifty-seven years.

A preliminary series of seven patients received intravenous injections of the first preparation, the neutral salt. In each case the administration was followed by a reaction, the mildest of which consisted of marked flushing, with a sensation of heat in the skin and considerable nausea. In other patients there was severe nausea with emesis. Three individuals who were able to continue treatment showed no improvement after the fourth injection and the treatments were discontinued. The acid acriflavine was supplied several months later. This new preparation, given to three patients of the first series, was found to produce no ill effects. The number of patients was then increased to twenty. It was found that the use of a concentrated solution occasionally caused venous thrombosis. In two instances there was nausea when the solution was injected too rapidly.

The acriflavine was supplied in ampules of 0.1 gram each. The contents of one ampule were dissolved in 20 c.c. of sterile distilled water and injected slowly. With this method 0.1 gram doses of the drug were given three times weekly and were well borne in every instance. Early in the series no ultraviolet therapy was used in conjunction with the treatment. Later, in cases which did not respond and in those in which improvement had come to a standstill, injections were followed by suberythema exposures to the alpine lamp. In all cases throughout the treatment an ointment containing three per cent salicylic acid and six per cent sulphur in vaseline was applied to the lesions daily.

While several cases showed little or no improvement, the majority were benefited and in four the results were striking. Case 2 had for years been incapacitated from work because of the severe involvement of his hands and finger nails. He had been under our observation for two years, the condition having been intractable to other types of therapy. Although the last vestiges of the eruption did not entirely disappear, he improved rapidly and was soon able to resume manual work. Cases 4 and 14, both women, gave a similar history of resistance to other forms of treatment. Their eruptions disappeared entirely by the ninth and tenth injection respectively and at the present time, after an interval of three months, there has been no recurrence.

It was noted that the nummular type of lesion responded best to this form of therapy. In our series the results in the females were better than in the males, the best response being seen in the females with the nummular type of psoriasis.

Involution of the psoriatic lesions under treatment followed a definite course. There was a gradual flattening of the papules and a diminution of the scales leaving a pigmented area in the patch formerly involved. This pigmentation faded slowly and was the last evidence of the eruption to disappear. A majority of the cases

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CASES TREATED

Case	Age	Sex	Type	Location	Duration	Injections	Lamp	Results
1	31	F	Circinate and Guttate	Profuse eruption, trunk and extremities	12 yrs	8	None	No improvement, refused further treatments.
2	42	M	Diffuse and Nummular	Very profuse generalized eruption	24 yrs	24	After 15th Injection	Excellent. Eruption disappeared with exception of isolated papules.
3	57	M	Diffuse and Nummular	Trunk and extremities	10 yrs	15	After 10th Injection	Moderate improvement. Many lesions still present, although greatly faded.
4	38	F	Nummular	Elbows and knees	4 yrs	9	None	Eruption entirely disappeared in three weeks.
5	35	M	Nummular	Profuse, trunk and extremities	18 yrs	20	After 15th Injection	Much improved. Pigmented areas remaining with isolated papules.
6	40	M	Diffuse	Trunk and extremities	2 yrs	24	After 20th Injection	Much improved. Only few small areas remaining.
7	55	F	Nummular	Extremities	7 yrs	14	None	Eruption entirely cleared. Slight recurrence 6 weeks later.
8	20	M	Nummular and Guttate	Hands, arms and genitalia	3 yrs	24	After 6th Injection	No improvement. Exacerbation three weeks after discontinuing treatments.
9	22	M	Guttate and Diffuse	Extremities	2 yrs	18	None	Slight improvement.
10	43	M	Guttate and Nummular	Trunk and extremities	10 yrs	12	None	Marked improvement. Pigmentation with few isolated punctate lesions remaining.
11	31	M	Nummular	Profuse eruption of trunk and extremities and scalp	12 yrs	24	After 18th Injection	Very little improvement. Slight fading of existing lesions.
12	35	M	Nummular and Diffuse	Very profuse eruption, face trunk and hands	20 yrs	24	After 18th Injection	No improvement.
13	18	M	Guttate and Diffuse	Trunk and extremities	5 yrs	15	None	Moderate improvement. Many lesions disappeared. Those remaining greatly faded.
14	46	F	Nummular	Trunk and extremities	9 yrs	10	None	Entirely free from eruption.
15	38	M	Guttate and Diffuse	Profuse eruption, scalp, trunk and extremities	4 yrs	18	None	Moderate improvement. Many lesions disappeared; others unchanged.
16	35	M	Nummular and Diffuse	Scalp and extremities	3 yrs	18	After 15th Injection	No improvement.
17	42	F	Nummular and Guttate	Extremities	17 yrs	15	None	Many lesions disappeared. Others faded.
18	21	F	Guttate and Diffuse	Profuse eruption, scalp, face, trunk, and extremities	6 yrs	18	After 12th Injection	Very little improvement. Itching, which had been marked, relieved with first injection.
19	32	F	Guttate	Profuse eruption, face, trunk and extremities	2 yrs	12	None	Moderate improvement.
20	37	F	Guttate and Diffuse.	Profuse eruption, trunk and extremities	16 yrs	15	None	Marked improvement, although numerous lesions remained.



Fig. 1. Case Number 14 at the beginning of treatment.



Fig. 2. After six treatments. Note residual pigmentation with isolated papules.



Fig. 3. After nine treatments.



Fig. 4. One month after the last injection. Ten injections were given.

showed improvement without complete disappearance of the lesions. In these, improvement continued for a variable time and then remained stationary, leaving at the site of the psoriasis patch a pigmented area containing a few isolated, scaly papules.

In none of the cases in which the eruption disappeared entirely was violet ray used. It was further noted that lesions on the protected areas of the body showed involution as rapidly as those of the hands and arms, which were more exposed to actinic rays. Throughout the series the patients who showed improvement did so without the rays, although the addition of actinic therapy undoubtedly enhanced the value of the treatment. In three cases which showed no improvement with injections, the addition of radiation produced no beneficial results.

Obviously, then, improvement in these cases was not due entirely to the photosensitizing action of the drug. The antiseptic action of this and related dyes has long been known and successfully utilized in the treatment of other conditions. Whether it is this or some other property of the drug which is responsible for the therapeutic results is a matter for speculation.

While our results as a whole were pleasing, we do not wish to create the impression that we consider this drug as a "cure-all" for psoriasis or a specific in any sense. Equally good or better results have been reported with various preparations. It has long been known of this resistant disease that some cases will respond to one type of treatment while others require quite a different form of therapy. We recommend intravenous use of acriflavine, therefore, only as a practicable addition to the medicinal armamentarium in the treatment of psoriasis.

SUMMARY

1. Twenty cases of psoriasis vulgaris treated with intravenous injections of acriflavine are reported.

2. All but three cases of the series showed clinical improvement and in four cases the results were striking.

3. The therapeutic results cannot be entirely attributed to photosensitization.

4. Intravenous administration of acriflavine is of practical value in the therapeusis of psoriasis.

THE TESTIMONIAL INDUSTRY

Two or three years ago certain members of the medical profession were asked to answer a question that they were wholly incompetent to answer. The question was whether, in their judgment, the "toasting" process alleged to be applied to the tobacco in "Lucky Strike Cigarettes" was likely to free the cigarettes from irritation to the throat. In addition to the questionnaire, the doctors received a carton of 100 cigarettes. The Lucky Strike people now claim that over 18,000 physicians answered the question given in the affirmative. Today physicians in the south and possibly other sections of the country are being circularized by the concern which exploits "Ironized Yeast." "Ironized Yeast" belongs to the get-plump-quick class of nostrums. It is a mixture of yeast and iron. It also contains phenolphthalein. The circular letter that the Ironized Yeast Company is ending out to physicians starts out with this rather crude offer: "A GIFT WORTH $10 FOR YOU FOR JUST A LITTLE INFORMATION." The physicians are then asked to answer two questions, the answers evidently to be used in the exploitation of Ironized Yeast. For the answers written on his own stationery, the physician is offered "a luxurious flacon of exquisite French perfume—TOUT PARIS DE GUIMET regularly sold at $10." Will the medical profession bite? (Jour. A. M. A., August 30, 1930, p. 679.)

EXTRA-UTERINE PREGNANCY: ANTECEDENT AND SUBSEQUENT HISTORIES IN 471 CASES*

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THE possibility of extra-uterine pregnancy must often be considered in the examination of women as a routine during the child-bearing period. Some such patients never have the alarming symptoms listed in textbooks, and they recover spontaneously if complete tubal abortion occurs during the early weeks of pregnancy. The ovum dies, the bleeding stops soon after the tube is emptied, and the resulting hematocele and fetal structures are absorbed, leaving little, if any, pathologic evidence. The same result occasionally follows rupture of a tube between the folds of the broad ligaments, with production of an intraligamentous hematoma and death of the ovum. Such patients experience severe pelvic pain, marked local tenderness, definite tumor on the side of the rupture, and more or less shock. However, if bleeding stops, the patients recover. Every lithopedion represents an ectopic pregnancy that has progressed past the fourth month and in which the fetus has died. In such cases, however, the condition has not been recognized until at operation months or years afterward. Masson and Simon in 1928 reported nine cases in which lithopedions were observed at The Mayo Clinic in a study of 445 cases of extra-uterine pregnancy.

Statistics on the incidence of tubal pregnancy vary a great deal. From some clinics, an incidence as high as one in 150 normal uterine pregnancies is reported, whereas from others the ratio is reported as one extra-uterine pregnancy to more than 300 normal pregnancies.

Fecundation probably occurs normally in the outer part of a fallopian tube, and the fertilized ovum is propelled by the musculature of the tube and the ciliated epithelium into the uterine cavity, where, under normal conditions, it becomes attached and develops during the following forty weeks. If for any reason the passage of the ovum along the tube is interrupted, and it becomes embedded in the tubal mucosa and commences to develop, extra-uterine pregnancy results. It is Kline's belief that more or less decidual reaction occurs at the site of implantation. Williams believes that the main purpose of the decidua is to protect the maternal tissue against invasion by the trophoblastic cells. Hemorrhage depends on the inability of the relatively scant decidua in the cases of tubal pregnancy to prevent invasion of the musculature and blood vessels.

Polak mentioned three types of ectopic pregnancy: (1) that in the free end of the fallopian tube (76 per cent); (2) that in the isthmic portion of the tube (21 per cent), and (3) that in the intramural or interstitial part of the tube (3 per cent). The possibility of the occurrence of ovarian pregnancy must be admitted, since cases have been reported. One case of abdominal pregnancy, with placental attachment to the under surface of the liver and the transverse colon, was referred to by Williamson. I believe, however, that it may be inferred safely that all cases of extra-uterine pregnancy are primarily tubal, and that the placental attachment elsewhere is secondary.

The etiologic factors predisposing to the production of tubal pregnancy are: (1) previous inflammatory condition in the tubes; (2) previous inflammatory condition in other pelvic or abdominal organs; (3) previous operations; (4) congenital anomalies affecting the tubes, such as points of stenosis and diverticula, and (5) kinking or partial obstruction of the tubes as the result of malposition of the uterus or as the result of pelvic tumors. Moreover, the possibility of tests for sterility predisposing to the condition has been suggested by some authors.

The early diagnosis of tubal pregnancy is always difficult. As has been stated, in cases in which early death of the ovum occurs the symptoms are mild and of such short duration that a diagnosis is not made. On the other hand, the symptoms may be those of an acute abdominal lesion associated with extreme pain and tenderness in the pelvis, more marked on one side, or of severe internal hemorrhage, general shock, and slight or moderate vaginal bleeding. In most cases the history indicates a condition between

*From the Division of Surgery, The Mayo Clinic, Rochester, Minn. Read before the Minnesota State Medical Association, Duluth, Minn., July 14 to 16, 1930.

these two extremes. The degree of pain is in direct proportion to the amount and rapidity of dilatation of the tube, or to the tearing apart of the fold of the broad ligament as the result of tubal rupture and of hemorrhage between the folds of the broad ligament. Weakness, dyspnea, fainting, shock, and collapse are dependent on the amount and rapidity of intra-abdominal hemorrhage. The amount and frequency of vaginal bleeding vary a great deal in different cases, but are never excessive. Kline stated that vaginal bleeding is not caused by separation of uterine decidua, and that in many cases such a structure does not develop. Curtis expressed the belief that decidua exists as long as the fetus is alive and it disappears after the fetus dies. Polak and Wolfe expressed the belief that vaginal bleeding continues as long as the ovum is alive and has any attachment to the tube. Such bleeding is from the uterus and not from the affected tube. Free uterine bleeding always means something other than tubal pregnancy; it generally means abortion. The association of intra-uterine and extra-uterine pregnancy, with symptoms of threatened abortion, should be suspected in such cases. Stein reported thirty-six cases observed since 1913. The temperature, as a rule, is only slightly elevated. The leukocyte count frequently changes; Farrar and Hendry believe it to be an index to the amount of free blood in the peritoneal cavity. The larger the amount of free blood, the higher the polymorphonuclear leukocyte count. The data obtained on bimanual pelvic examination naturally are dependent on the pathologic condition, and on the site of the abnormally situated products of conception. The possibility of the condition being bilateral must be considered. Johnson and Diasio reviewed ten cases from the literature published during the last seven years and added one of their own. The amount of bleeding that has occurred, and whether it has been between the folds of the broad ligaments or free into the pelvic cavity, naturally will affect the changes found. Also, whether the bleeding has been frequent in small amounts, with time for walling in, or whether it has been copious, and of recent occurrence, will modify the symptoms and signs. Insertion of a needle into the culdesac, or vaginal puncture, is often practiced by certain gynecologists, but the method is not without danger.

As a rule, there is nothing suggestive in the history of the case until after the first month of pregnancy. The patient may then be suspicious that she is pregnant. Later, on account of colic-like pelvic pain and irregular vaginal bleeding, she seeks medical advice. In many cases the early symptoms are much more alarming, the terrific pain and free intra-abdominal bleeding making emergency treatment advisable.

I believe that abdominal section, with removal of the affected tube and control of hemorrhage, is advisable in all cases as soon as the diagnosis is made, provided the patient is in a well-organized hospital where a satisfactory and safe anesthetic can be given and where a solution of gum acacia can be given intravenously, or a transfusion of whole blood, properly tested. The preferable method of anesthesia in critical cases is local anesthesia with ethylene by inhalation. I have never resorted to autotransfusion, but in the absence of gum acacia or a suitable donor, it would be advisable. There is no doubt that many patients who are in collapse immediately following severe hemorrhage will improve if treated expectantly, but there is no assurance that they will improve; many do not, and every minute of delay adds to the danger. Two patients in the series to be reported here were admitted in extremis and died of hemorrhage without operation. Vaginal section is advised in some cases of tubal pregnancy, but under modern technic I believe that abdominal section is to be preferred in all cases.

If the patient is in good condition, an operation is a relatively safe procedure and satisfactory results will be obtained in a high percentage of cases. On the other hand, if there has been excessive intra-abdominal bleeding, if there is superimposed infection, or if the ovum has survived the tubal abortion or tubal rupture and has advanced to the stage of abdominal pregnancy, the operation may be one of great risk. In cases of abdominal pregnancy, there will be decidedly less risk to the mother if the operation is delayed until well after the time of expected confinement and death of the fetus, since the blood supply will be much reduced and the fetal structures can be removed without risk of severe hemorrhage. If the patient can be cared for by an experienced surgeon in a well-equipped hospital, operation should be performed promptly in an

endeavor to save the child, even though many such children are crippled or deformed.

In a previous paper on extra-uterine pregnancy and subsequent pregnancies, results in 198 cases were reported. Eighty-seven (44 per cent) of the 198 patients became pregnant after having had an extra-uterine pregnancy. In all, the number of pregnancies subsequent to extra-uterine pregnancy was 162, and in 111 of these the pregnancies were normal. In thirty-four cases (20 per cent of the 162) the pregnancies were intra-uterine but terminated in miscarriages. Eighteen (less than 12 per cent of the 162 pregnancies) were extra-uterine. Therefore I believe that bilateral salpingectomy is not a justifiable operation for extra-uterine pregnancy if the opposite tube is apparently fairly normal.

From January 1, 1903, to December 31, 1928, 471 patients with 486 extra-uterine pregnancies were treated at The Mayo Clinic; 168 of these patients were reported on in 1914 by Mussey. The youngest patient was aged fifteen years, and the oldest was aged fifty-two years. The average age for the patients was thirty-one and seven-tenths years. In twenty cases the ovum was still developing in the tube when operation was performed. From the operative description, it was often impossible to determine whether tubal abortion or tubal rupture had occurred, but there were probably at least twice as many cases of tubal abortion as of the more serious complication of rupture.

There were seven cases of abdominal pregnancy, in three of which the pregnancy had reached full term. In one case an apparently normal child was delivered, but died suddenly about seventy-two hours later. In another case, a deformed child was delivered who died about two hours after birth. In the third case, the fetus, which was macerated and had reached full term, was dead and probably had been dead for about six weeks. It was possible to remove the placenta and greater part of the membranes in each case; the mothers all recovered uneventfully. In the other four cases of abdominal pregnancy the fetuses were alive and were between four and five months old. Lithopedions were found in ten cases. There were three cases of bilateral tubal pregnancy and one case in which a twin pregnancy existed in one tube. Cases of associated intra-uterine and ectopic pregnancy were not found.

The average length of married life for the group was eight and nine-tenths years. Previous sterility and previous abnormal pregnancy stressed by Allen are important etiologic factors. In this series, 109 (23.14 per cent) did not give a history of previous uterine pregnancy and fifty-three (11.25 per cent) gave a history of having had only miscarriages or ectopic pregnancies.

A history of previous pelvic disease was obtained in 221 (46.9 per cent) of the cases. The average length of time from the last menstrual period to the onset of symptoms was ten and sixty-two hundredths weeks. Pain was the chief complaint in 278 (62.32 per cent) of the cases. In 160 (36.03 per cent) vaginal bleeding was the chief complaint but it occurred in others as well; namely in 375 cases (79.61 per cent of the total number). The average blood pressure in millimeters of mercury was systolic 118.56, and diastolic 82.61. The average pulse rate was 90.5 beats each minute, the average temperature 98.84° F., the average hemoglobin 66.41 per cent, and the average leukocyte count 9,080 in each cubic millimeter of blood. There were six deaths following operation, an operative mortality of 1.27 per cent. Two other patients were admitted in extremis and died from hemorrhage without being operated on.

In two cases in this series, early tubal abortion was found accidentally at necropsy; one patient had died of acute nephritis, and the other of carcinoma of the esophagus.

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PHYSIOLOGICAL RESPONSE OF GUINEA PIGS TO ETHYLENE DICHLORIDE VAPOR

The United States Public Health Service, in coöperation with the Bureau of Mines, has conducted certain investigations relating to the effect of the several gases used in household refrigerators. Such investigations relating to ethylene dichloride vapor are of interest. The acute physiological response of guinea pigs exposed to air containing ethylene dichloride vapors was determined. The concentrations of vapor and periods of exposure ranged from those which produced death in a few minutes to those that caused no apparent effect after several hours. The symptoms, gross pathology, and fatality are given, together with a brief discussion of potential health hazards.

1. In the order of occurrence, the symptoms produced in guinea pigs by inhalation of ethylene dichloride vapor are eye and nose irritation, vertigo, static and motor ataxia, retching movements, semi-consciousness and unconsciousness accompanied by uncoördinated movements of the extremities, and death if exposure is continued. Exposure to 6 per cent vapors causes all these symptoms, excepting death, to occur in less than 10 minutes, and death in about 30 minutes. Exposure to 1 per cent causes all the symptoms to appear in 25 minutes with the possibility of death occurring a day or more following an exposure of about 15 to 20 minutes. Exposure to 0.12 per cent did not cause apparent symptoms or death following an exposure of eight hours.

2. The gross pathological findings were hyperemia, congestion and edema of the lungs with secondary degenerative changes in the kidneys. The severity of the pathology increased with the concentration of vapor and duration of exposure. The lung lesion was the most prominent and probably the greatest causative factor in death. No serious pathology was found for the following concentrations of vapor and periods of exposure: 6 per cent for 5 minutes, 1.7 per cent for 10 minutes, 0.4 per cent for 30 minutes, 0.2 per cent for 120 minutes, and 0.11 per cent for 480 minutes. Also these concentrations and exposures did not cause the death of the animals.

3. The summarized physiological response given in the four degrees usually reported are: 10 to 20 per cent kills in a few minutes; 0.4 to 0.6 per cent, dangerous in 30 to 60 minutes; 0.35 per cent maximum amount for 60 minutes without serious disturbances; 0.1 per cent, slight symptoms after several hours or maximum amount without serious disturbances.

4. A comparison of the results obtained with those reported in the literature for other compounds indicates that for single exposures and periods of an hour or more the toxicity of ethylene dichloride appears to be of about the same order as gasoline, benzene, carbon tetrachloride, and chloroform. For periods of less than an hour it is less toxic than these compounds.

5. The odor of ethylene dichloride is distinct and noticeable, and warning symptoms are produced by relatively safe concentrations.

SURGERY OF THE INFANT ABDOMEN

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IN common usage the term infancy possesses a vague significance, and for the sake of accuracy it will be well to state the basis upon which the following discussion rests.

The newborn enters first into a neonatal period which extends over two or three weeks. This is the time of greatest change and adjustment, in physiology as well as anatomy, and one in which growth and function are almost constantly being brought into new relationships. Immediately following this and extending to the thirteenth or fourteenth month, when the erect posture is assumed, is the period of infancy proper; the period of life that I propose to consider at this time.

The medical treatment of diseases of infancy is upon a sound and rational basis and the pediatrician has assumed his proper position in the field of medicine. Surgery unfortunately has only given reluctant consideration to any modification of its status and in the main treats the child in terms of the fully developed individual.

Surgery of the infant abdomen is quite as distinct a field as is the medical treatment of infant diseases. It is true that the fundamental pathologic conditions are the same at any age; yet the clinical material wherein they are manifested differs greatly. Hence the application of any curative or palliative measures must be made to conform to this variation. Anatomically the newborn is different from the adult, not alone in size but in proportion, and, what is not generally appreciated, this proportion is an ever-changing one. Casual observation notes that the individual's increase in size is not uniform and that he passes through periods of alternative activity and passivity. But this by no means implies that the various body constituents increase uniformly and synchronously, for they do not: they increase with wave-like increment, subject to their physiologic need.

The skeleton of the body, being subject to its functional demands, as a whole increases its measurements in a curve very like that of Figure 1.

The bony framework which supports the abdomen of the infant furnishes a basis for the many variations from the adult, as may be seen in Figure 2.

The cervical, thoracic and lumbar segments of the infant vertebral column occupy respectively one-fourth, one-half and one-fourth of its total length, while in the adult, growth has rearranged the limits to one-sixth for the cervical, one-half for the thoracic and one-third for the lumbar.

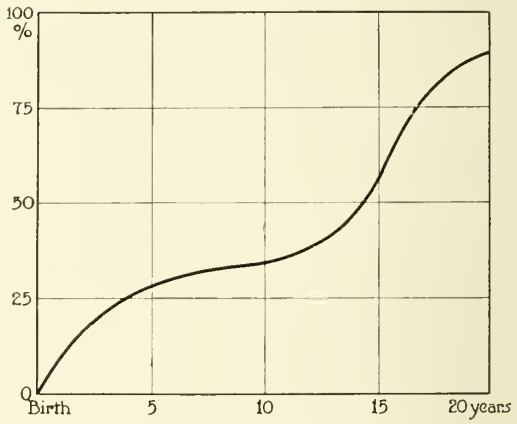


Fig. 1. General growth curve.

Thus it will be seen that in the newborn the longitudinal measurement of the abdomen is relatively much shorter than in the adult. This is made more effective by the absence of the lumbar curve, which appears with the assumption of the erect posture.

The pelvis itself tends to further constrict the abdominal content, as in the infant it is not only more vertical but much shallower and relatively narrower than in the adult. As a result, the abdominal viscera of the newborn must conform to a relatively short axis and a rigid shallow inferior limit.

The upper limit, a more expansile structure made up of the diaphragm and lower rib margin, partially compensates for the constriction by a circumferential increase giving rise to the outward flare of the lower thorax. This, however, is not entirely adequate and the excess bulk of the viscera bulges forward, the abdominal parie-

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tes giving to the infant the aldermanic proportion which he will only regain in later life.

An examination of the abdominal walls themselves yields definite yet less striking differences

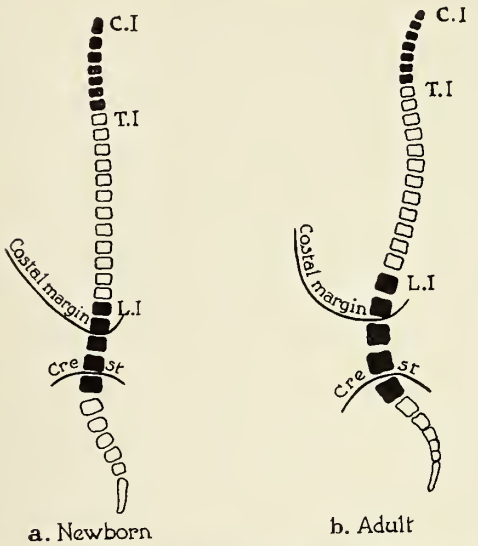


Fig. 2. A comparison of *A* and *B* shows the relatively short lumbar spine in infancy.

than may be found elsewhere. The skin and subcutaneous fat are largely dependent upon the nutritional state and consequently are variable factors. The same is in a measure true of the musculature, which is differentiated to the same degree as in the adult, although proportionately thinner. The fascial development, while nearly proportional to the muscular development, is nevertheless markedly deficient. The aponeuroses of the oblique muscles are thin and delicate and are relatively much less in extent than in the adult. Likewise the anterior and posterior sheaths of the recti are of such fine texture that their constituent fibers can be readily separated. But quite the contrary is true of the peritoneum, which in the newborn is nearly as thick and as strong as in the adult, and on the whole this is perhaps the most noteworthy feature in the parietal structure.

The abdominal viscera at birth present an epitome of fetal life, each an index of its former importance and in total disregard of its future function.

In accordance with this scheme, the liver occupies the greatest space. In fact, in the newborn it occupies two-fifths of the abdominal cavity. As a result it is forced far below the costal margin and a considerable distance to the left, in contact with the spleen. As may be seen in Figure 3 it is relatively much larger than in the adult. The ligamentum teres, so recently a channel for the umbilical blood, is also large, and

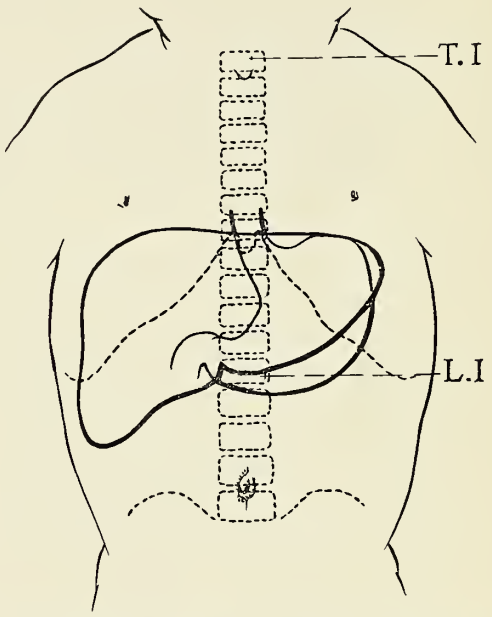


Fig. 3. The skeletal and visceral relations in the infant abdomen.

forms a prominent broad attachment to the anterior abdominal wall.

The spleen in contradistinction to the liver has an apparent rather than real importance, and as regards size alone is more proportional to the adult. Its position in contact with the left lobe of the liver at birth brings it into greater prominence than it occupies in later life. As yet, its ligamentous attachments are only imperfectly vascularized and the vasa efferentia of the adult splenic ligaments are difficult to identify.

The stomach of the newborn is a vertical stomach, but for only a few days, when it becomes transverse, a position which is maintained until the erect posture is assumed. While at birth it is of a few cubic centimeters capacity this rapidly increases during infancy and at one month it has doubled and in a few months more quadrupled. This growth is downward and laterally, the greater curvature escaping under the liver margin and at the same time forcing the spleen to the left and posteriorly.

The levels of the cardia and pylorus are relatively the same in infants and adults, but are both relatively nearer the pelvic brim in the newborn.

The remaining portion of the gastro-intestinal

tract exhibits little of interest except for the cecum. The head of the cecum almost uniformly is found in the right iliac fossa and in the same relative position as in later life, although the relatively large liver and short lumbar segment lend color to the belief that its position changes with postnatal development.

The foregoing brief survey of the grosser visceral differences between infant and adult has been presented not alone to recall mere structural detail but to emphasize what the texts so often neglect, namely, that the newborn is a distinct anatomic entity.

That the infant is a distinct organism to the physiologist is equally true and the biochemical change is no less evident than the structural one. Much of this is inter-related and exhibited as biophysical phenomena. For example, the proportion of mass and surface area is such as to give the newborn a relatively larger area of radiation. This not only modifies the mechanism of heat production, but also its regulation. In close association with this is the fact that the infant has an average water content of 75 to 80 per cent, and requires for growth maintenance about 150 cubic centimeters per kilo per day, which is far in excess of adult needs. From Marriott's observations on the phenomena of anhydremia it is seen that the infant is peculiarly susceptible to disturbances of water balance. The work of Dragstedt and others would suggest that chloride loss may be of equal importance.

Dismissing thus briefly the normal, let us consider for the moment the pathologic processes. Again the infant is unique in that only rarely is the abdomen invaded by bacterial disease processes. The gallbladder and appendix, so commonly affected in later life, are remarkable in this immunity, and peritonitis, when it does occur, is almost invariably primary or due to surgical invasion. As a corollary to this it may be noted that when infection becomes established anywhere in the body of the infant, it more readily overwhelms the patient and bacteremias are more frequent in infancy than adult life; perhaps because of the yet undeveloped immunity. This is in keeping with Hermann's observations and would conform to his idea that peritonitis is an immunity phenomenon. The blood changes are a bit more difficult to evaluate than in the adult. The inversion of the polymorphonuclear and lymphocyte counts and the rapid changes in total counts in the neonatal period tend to diminish the importance of leukocytosis as a diagnostic aid. Nevertheless, if the work of Bakwin-Morris and some others is to be accepted, a leukocyte count above 10,000 in infancy proper is to be considered pathological.

Unfortunately temperature and pulse changes are not so significant and only the very marked variations can be taken as evidence of definite disease processes.

To summarize the pathological considerations the surgery of infancy is for the most part the surgery of obstruction. Of these, hypertrophic pyloric stenosis and intussusception are by far the most common. It is true that there remains a certain number of patients who require operation because of congenital anomies either developmental or in the form of new growths. These, however, require only special technical consideration and are subject to the same general underlying principles which govern the more common operative procedures.

Under ordinary circumstances the infant tolerates operation surprisingly well for short periods. It must be borne in mind, however, that mortality accrues not so much from the magnitude as the duration of the operation. In the adult it is often possible and permissible to be deliberate or even dilatory, but in the newborn there is not that stamina and tenacity to life which allows protracted surgical trauma.

It is obvious that in the early days of life the nutritional state of the patient is always the prime factor in determining his operability. Unfortunately it is not always possible to delay sufficiently to institute proper feeding methods and await a gain in strength and vitality and often we are confronted with a grave surgical condition complicated by starvation and dehydration. To avoid existing or impending dehydration phenomena the ingestion of rather large amounts of fluid under the skin, transfusion into the fontanelle and the intraperitoneal injection of blood or saline are of inestimable value.

It is not my purpose here to dwell upon the rationale of operation but to feature a few points which I believe further a happy termination.

Ether should be the universal choice for anesthesia chiefly because it permits the maximum of effort with a minimum of manipulation. Nothing is so fatal to success as prolonged handling of

already injured tissue. I can see no reason for the extensive mid-line incision so often employed; moreover, infants do not tolerate evisceration nor is the mid-line an advantageous situation for union. Recalling for the moment the topography of the protuberant infant abdomen, the logic of the right rectus incision is at once apparent.

The closure of wounds in adults is generally a matter of relatively little difficulty and may be accomplished by a variety of methods. Not so, however, in the infant. As noted before, the fascia is ill suited to any considerable strain and is surprisingly friable. Because of this and the relatively greater tension exerted (for the infant seems to be striving to break himself open) operative wounds in infants are prone to rupture. And as this is at times a cause of secondary obstruction necessitating reoperation, too much care cannot be employed.

Once off the operating table the patient is out of the surgeon's hands and again becomes a pediatric liability, for it is only inviting disaster to attempt the dual rôle of surgeon and physician. The surgeon may achieve a brilliant operative success but it rests with the pediatrician to conserve it.

In conclusion, rather than attempt a summary of what has gone before, let me reiterate the surgical and anatomical disparity between infant and adult, the necessity for speed and proper medical coöperation. In short, here as elsewhere it behooves us to be accurate, thorough and to be brief.

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President's Letter

THE increase in knowledge during the last fifty years has opened an ever multiplying number of avenues from which additional knowledge may be gathered. A practical result is observed in the lengthening number of years young people are required to attend school to fit themselves for their various vocations in life. Especially is this noticeable in the professions and more particularly in the profession of medicine. This vast available knowledge with its practical application has led necessarily to the division of work into many fields. Thus specialism is born.

Medical schools, medical men, medical students and a large and intelligent block of the laity recognize the need of highly scientific men, technical men trained in the field of *research;* the need of thoroughly scientific men trained in the field of *clinical medicine;* and the need for a reduction in time taken to graduate well trained young clinicians, fit to cope with at least 85 per cent of the ills that are encountered in the everyday practice of medicine.

Much intelligent effort is being made to meet these needs. The first is an easy problem to solve; the two latter are more difficult. Johns Hopkins Medical School is an example of the ultra scientific type of school, leaning strongly to the technical training of its students. The University of Pennsylvania Medical School is an example of the type which stresses the teaching of clinical medicine. (Both of these institutions are maintained by private endowment or by the latter together with subscriptions. They are not state supported.)

The tendency in the former type of school is to build its faculty of purely technical men—whose whole time is devoted to the educational interests of the institution. The latter type of medical school endeavors to utilize the knowledge and experience of the practicing physician of recognized skill and teaching ability. His advice and wisdom are sought in formulating and directing the clinical course of study—the clinical curriculum. He is made a member of the faculty and as such enters into the councils of that body. He has something to offer in the training of medical students that the technically and institutionally trained educator does not possess, and therefore cannot give. His active participation in teaching the purely clinical subjects rounds out the purpose of the school. He should have a free hand in conducting the clinical courses and be held responsible for results.

Both of these types of medical education are valuable and both have a definite field of usefulness. Prospective medical students, and their parents, must of necessity be interested in knowing the type of the medical school best suited to meet their needs. Those interested in the study of medicine are often sorely perplexed in choosing a medical school. Too often the choice is determined by such considerations as the size of the institution, its distance from home, the expense, and perhaps other and minor matters. *Primarily the choice should rest upon the ultimate purpose of the student.* Does he wish to become a highly and technically trained medical scientist, tending strongly to and desiring to follow a life of research? Or, does he choose to become a thoroughly trained clinician, practicing medicine among the people, contributing to their relief from suffering and distress, entering intimately into their lives and understanding their problems and needs as only the true physician can, and becoming an active and integral part of the social life of the community in which he lives?

These considerations then should decide him in choosing the type of school in which he will matriculate as a medical student. It should be borne in mind, in making this decision, that but few men and women are by nature adapted to research work. The earnest student, while in his pre-medical course, with the aid and counsel of his instructors (providing these are observant, logical and not too narrow in their outlook), should be able to know his mental and intellectual tendencies pretty well by the time he is ready to enter upon his medical course. He should be able then to decide upon the type of medical school he will attend. The decision is of extreme importance for therefrom the whole course of after life takes direction.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

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SUPREME COURT OF MINNESOTA UPHOLDS BASIC SCIENCE LAW

On October 10, 1930, the Supreme Court of this State declared the 1927 Basic Science Law constitutional in a splendid opinion written by the Hon. Andrew Holt, Associate Justice. The decision of the Court was unanimous. The rendering of this decision is of tremendous importance, not only to the people of the State of Minnesota, but to the medical profession as well. It is the first time in the history of the United States that the constitutionality of a Basic Science Law has been passed upon by a State Court of last resort. Again Minnesota pioneers in the field of legislation designed to more adequately protect the public health, to raise the standards of the medical profession, to eliminate quackery and to make it possible to more effectively dispose of the quacks who for years have been preying upon the sick.

The Minnesota Basic Science Law was enacted on April 12, 1927. It was passed in the Senate by a vote of sixty-one to two. It was then passed in the House by a vote of one hundred eleven to seven. Thereafter it was re-passed in the Senate by a vote of forty-four to one. The overwhelming vote in favor of the law clearly indicates the wonderful work done by the Minnesota State Medical Association and the Legislative Committee headed by the very able Dr. H. M. Johnson of Dawson. The vote also indicates the broad minded and receptive attitude on the part of the Legislature to enact a law that was extensive in its scope and one that had provisions in it for the enforcement of the law after its enactment. The law is a tribute to the intelligence of the Legislature and we feel that credit should be given where credit is due, particularly in these days of unrest and criticism.

Following the enactment of the Basic Science Law the State Board of Medical Examiners set in motion the machinery provided in the law for its enforcement. The annual registration fee paid in January of each year by every physician and surgeon registered in this state was made available for the enforcement of the various provisions of the law. This money is in the custody of the State Treasury and is expended by the Board as the law requires. The Medical Board has been engaged in a vigorous campaign of prosecuting those who have been practicing healing in the state without lawful right. The Board is also making every effort to make Minnesota as uninviting as possible for quacks in other states. We are certain that the Board has the united support of every member of the medical profession in their efforts. It was this work on the part of the Medical Board in connection with a recent case that precipitated the present decision in the Supreme Court.

The opinion written by Justice Holt clearly indicates that very careful consideration was given

the law and it is interesting to note some of the matters contained in the opinion. Before this is done it might be well to consider some of the objections raised against the law. The first serious objection raised against the law was that the Legislature had no right to authorize the issuance of Basic Science certificates to those lawfully engaged in the practice of healing at the time of the passage of the law. To this the Court said:

"The law is neither arbitrary nor unreasonable in the respect of treating those already licensed as compared with those to be licensed after May 1, 1927."

The Court further said:

"No one can legitimately object to laws raising the standard of knowledge which might aid in the treatment of human ills by those engaged in that calling."

Another contention against the law was that it was unreasonable and arbitrary for the Legislature to classify those engaged in the practice of healing. That is, to make special provision for dentists, nurses, midwives, masseurs and the like. To this contention the Court said:

"Each occupation comes in contact with the human body and may affect its well-being, but none of them relates to what is generally understood as taking charge of persons affected with disease or bodily injury to effect a cure, if we except dentists."

The Court further said:

"With the wisdom of legislative classification, courts are not concerned. In laws of this sort all evils cannot be reached at once, nor every desirable object gained in one legislative session."

We wish to emphasize the significance of the last quotation. It is not possible in this day and age to secure the enactment of every desirable law at one session of the Legislature. Conditions change; new methods of quackery are devised; new cults are formed and laws must necessarily be enacted from time to time to meet these conditions. The Court clearly emphasizes the right of the Legislature to recognize degrees of harm and to proceed step by step and to enact laws that presumably hit the evil where it is most felt.

POLIOMYELITIS IN MINNESOTA

The present epidemic of anterior poliomyelitis began in Nobles County in April and was confined almost wholly to the southwestern part of the state until the latter part of the summer. In August, cases were reported from fourteen additional counties for the most part in the southeastern part of the state. During Septmber the epidemic had further spread, cases being reported in twelve additional counties, and in October, twelve more counties were invaded. The State Health Department gives the following cases reported each month: April—1, May—3, June—16, July—59, August—80, September—100, October (to the 29th)—76. The peak of the curve showing incidence of the disease was reached the first week in August. Instead of the rapid incline usually experienced, this year second and third peaks recurred the first and last weeks in September which were nearly as high as the one in August.

Epidemics have been reported in Illinois, California, and southeastern Wisconsin, and figures show a rather general epidemic throughout the country.

Our worst state epidemic was in 1909 and 1910 when 234 and 201 deaths respectively were reported. In 1916 another epidemic occurred in which there were 912 cases reported with 105 deaths; again in 1921, 705 cases and 102 deaths; and the last epidemic in 1925 with 941 cases reported and 145 deaths. Doubtless the reported cases make up a comparatively small portion of the total cases existing in any epidemic. It is no unusual experience to discover other members of the victim's family ill with fever, headache, sore throat, nausea or vomiting, and perhaps a little neck rigidity and no paralysis, or maybe only a slight paresis or merely an exaggerated reflex which could be readily overlooked. Some have estimated that only about 20 per cent of cases are diagnosed.

This frightful disease which hits like a stroke of lightening here and there and carries a mortality of 11 to 15 per cent, and, what is perhaps worse, leaves its victims ofttimes with extensive paralysis, must however be classed as an infectious disease. The most logical assumption is that a large majority of adults are immune and a certain percentage carriers of the infection. The usual seasonal occurrence of epidemics, the height of the epidemic occurring in August, is difficult to explain. Males predominate among those stricken and the disease occurs more frequently in the first five years of life than in any other five-year period. The mortality rate, however, usually increases with maturity.

The symptoms above mentioned, in the presence of an epidemic should arouse suspicion on

the part of parents and physicians. A frank paralysis leaves no room for doubt. A rigidity of the neck and an increased cell count in the spinal fluid in the presence of an epidemic is sufficient to warrant a diagnosis, isolation, and whatever treatment is possible. There seems to be enough evidence of the value of convalescent serum to warrant its trial. A certain amount of convalescent serum has been available at the University Medical School since September 27. This is obtained by allowing the blood from a convalescent to clot, filtering the serum, and adding a preservative. Twenty c.c. given intramuscularly as soon as a diagnosis is possible, is recommended. The delay to physicians throughout the state incident to sending to the University is costly for the patient. More practical would be the administration of approximately 40 c.c. of blood from a convalescent even though a period of years had intervened since the infection of the donor. Recent experimental work* on this poliomyeliticidal action of normal human serum *in vitro* and the occasional favorable result,† in poliomyelitis with the use of serum from normal non-convalescent adults suggests a practical method worthy of trial.

The use of convalescent serums for wholesale immunization is out of the question.

Physicians should be on the alert to diagnose this disease as early as possible in order at least to establish isolations and quarantine. Although serum treatment cannot be said to have been firmly established, every effort should be made to give it a fair trial.

*Shaughnessy, H. J., Harman, P. H., and Gordon, F. B.: Neutralization of the virus of poliomyelitis by human sera. Proc. Soc. Exper. Biol. and Med. 27:742 (May) 1930.

†Zingher, Abraham: The diagnosis and serum treatment of anterior poliomyelitis. Jour. Am. Med. Assn. 68:817 (March 17), 1917.

FOOD FADDISTS

Statisticians have enjoyed the memorable distinction of the superlative in prevarication—"liars, d— liars, and statisticians." In grades of dumbness in like ascent the banner for excellence goes to food faddists. Unfortunately the management of a most worthy milk products firm will not read these lines. Few physicians will hesitate to lend full support.

A recent comment in a magazine states that no one should presume to write an editorial unless he feels and thinks deeply upon the subject treated. Well here goes:* I believe in food—three times a day. I agree with a somewhat obese confrère who says, "Eating is one of our greatest indoor sports." It is possible to even go further: The good old summer time picnic with its ozone, scenery and clutter of indigestibles is far from an affliction, and invites God-given rest to an overwrought brain even though it may clog up a burdened liver.

Need I describe the paid minion assaulting a series of luncheon club groups and culinary assemblies, not to mention our schools, with the absurd statement that everything we are depends upon the food we eat? "Tell me what a man eats for breakfast and I can tell you the reaction he has throughout his day," thunders this oyster. "Look to the cause, gentlemen—if you ever expect to empty our asylums and almshouses, overcome our appalling illiteracy and helpless inefficiency, then learn first to choose your own food and that of your children!"

It is almost a calamity that vitamins have been scientifically exploited, the pseudo-scientific food vender has taken such horrible liberties with them. Man, with his magnificent adaptability to food, can live in almost any part of our known world. Look at the infinite variety in his diet adapted as it must be both to his needs and circumstances. And do not forget how gloriously the much cussed human economy adapts itself to definite poisons, albeit some of these are presently mollified by "toasting" and ultraviolet exposure! Aside from early life it is fair to state that any adults will have a strenuous task evading all needful vitamins in any half reasonable diet. Appetite and food enjoyment—one of our greatest boons in a neurasthenic age—must not be harassed by a flood of senseless taboos and "don'ts." Gourmands and human hippopotami deserve no commendation, but even at that they only hasten to Elysian fields. There they will not be annoyed by the presence of vitamin cranks huckstering cottage cheese and yeast.

E. L. T.

*Written after listening to a professional (Doctor) dairy products exhorter address a luncheon club.

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have under my care a case which I have diagnosed as complete heart block. The history and cardiac examination are as follows:

Man, married, age 40, farmer by occupation, has always done extremely hard manual labor. Admitted to the hospital with complaint of fainting spells and dizziness. The immediate condition lasted for about 24 hours and grew worse. He stated that he had had these spells in very mild form for the past year and a half to two years. About three days before admission to the hospital he became slightly overheated. He believes that this is the beginning of his condition. Past history was negative.

Pulse rate on admission was 22 per minute. Adrenalin, 10 minims, was given by hypo with marked relief. The cardiac examination showed the pulse rate to be 22, apex beat of the ventricle the same, and that of the auricle about 80 to 85 per minute. The picture showed that of complete heart block, and the patient was given ephedrine, grains 3/8, three or four times a day. This controlled the fainting spells, and the patient was fairly comfortable. Two days following this, continuing with ephedrine, barium chloride, grain ½, was given three times a day. The patient was kept in the hospital three weeks, pulse rate at no time going above 34. Beat was regular in both the auricle and ventricle. The patient improved generally, however, and was able to be up and around without any dyspnea. Atropine in full doses had no effect. The Wassermann was negative. Blood and urine examinations were normal. No foci of infection were found.

At the present time patient is able to do very light exercise with no discomfort, and his condition remains the same as at the time of discharge from the hospital. I would like to get your opinion as to whether or not anything further can be done for this man and as to the prognosis in the case.

Answer.—The following suggestions were received in regard to this case:

(1) From the history and findings there can be no question as to the correct diagnosis in this case, that of complete heart block. The question would be as to the etiology. With syphilis ruled out, it is very likely that coronary disease is at the basis. Because of this it might be well to give the patient metaphyllin, 1/10 gram, dissolved in water four or five times a day. In regard to the specific treatment, I cannot suggest anything further than that already instituted, ephedrine, 3/8 grain, and barium chloride, grain ½. Digitalis is indicated when there is any evidence of decompensation. Apparently this is not present now. Patient is to do only light work, of course. The prognosis is not very good, although I have had cases live quite comfortably for periods of ten years before decompensation set in. I think that the doctor in charge of this case is to be congratulated on his diagnosis and the management of the case.

(2) In the treatment of complete heart block in the presence of Stokes-Adams' phenomenan, we have had our best results in the administration of desiccated thyroid extract. We have very distinct evidence that the cerebral phenomena are not wholly the result of temporary ventricular asystole but may also result from under-ventricular filling and consequent insufficient ventricular outflow. It has been on this basis that thyroid extract has been given, and we have had numerous instances where the manifestations have been entirely controlled, and if not entirely controlled definitely modified. The drug should be given only after the determination of basal metabolic rates with checked readings, and an attempt, of course, should then be made not to produce a therapeutic hyperthyroidism. As a rule, one to two grains daily given in one dose, is sufficient provided the dosage has been accurately standardized and the case observed by occasional basal metabolic rate determinations. The drug may be continued over a rather indefinite period of time. It has no effect whatsoever on the auriculo-ventricular dissociation but it is merely an agent that by increasing the rate of combustion effects some increase in circulation rate. Barium chloride has been used with rather indifferent results, and its action depends upon increasing the irritability of the ventricle, frequently resulting in premature contractions, thereby sometimes increasing ventricular rate.

The general prognosis of complete heart block where the Stokes-Adams' phenomena have occurred is unfavorable. In our series the average expectation of life was about twelve months. Without the Stokes-Adams' phenomena the outlook is considerably more optimistic. The prognosis, however, is chiefly dependent upon the degree of heart muscle capacity, depending to a large extent upon whether or not the fundamental cardiac disease is rapidly progressive or not, and to an appreciable degree on the instituted regime.

(3) It is a clear-cut case of complete heart block which has been very well handled therapeutically. Apparently the Wassermann was negative; but in a case forty years old, I would recommend that the Wassermann be repeated at two different laboratories, making use of both the Kolmer technic and the Kahn technic. Complete heart block due to syphilitic gummatous infiltration, it is true, is fairly rare, but does occur, and in all cases forty years or under I think we should look for it very carefully, because, if it is due to syphilis, treatment directed against syphilis will very frequently clear up the heart block if not administered too late.

2. *Question.*—I have a youngster a week old who has bilateral congenital club feet. I wish you would advise me as to when treatment should be started and of what nature it should be.

Answer.—Correction of congenital club feet should be started in the first few weeks of life. Any simple appliance which will bring the feet in line should be used. A light plaster cast or a cardboard splint can be applied. In any event, the progress of the case should be followed very carefully so that frequent adjustment can be made. In this way it is possible to correct congenital club feet without an operation in most instances.

OF GENERAL INTEREST

Dr. Leon J. Tiber has moved from Saint Paul to Los Angeles, California.

Dr. Joseph Halpin is house physician at the Gillette State Hospital, Saint Paul, this year.

Dr. W. A. O'Brien now gives his health talk over WCCO each Wednesday morning at 11:15.

Dr. F. W. Schacht has left the Mayo Clinic and will practice in Winnetka, Illinois, limiting his practice to urology.

Dr. J. H. White, formerly associated with the Mayo Clinic, will continue practice with the Southwest Clinic, Phoenix, Arizona.

Dr. Charles N. Hensel, St. Paul, is recovering from a fractured leg received September 14 when he was thrown from a horse.

Dr. W. A. Coventry has just returned from a meeting of the American Obstetricians and Gynecologists in Buffalo, New York.

Dr. J. R. Hand, formerly associated with The Mayo Clinic, Rochester, has established offices in the Mayer Building, Portland, Oregon.

Dr. G. D. Guilbert, formerly of Waterville, Minnesota, is Associate Medical Officer at the U. S. Veterans' Hospital at Tucson, Arizona.

Dr. M. G. Gillespie attended the meeting of the American College of Surgeons in Philadelphia in October and was inducted into the College.

Dr. Emanuel Barnett is in private practice at Sanborn, Minnesota. Dr. Barnett was an interne at St. Joseph's Hospital, Saint Paul, the past year.

Dr. Donald De Coursey, who finished his interne work at St. Joseph's Hospital this year, is on the rotating service at the Veterans' Hospital, Minneapolis.

Dr. John A. Haugen is with the Detroit Receiving Hospital, Detroit, Michigan, where he is completing an interneship begun at the Abbott Hospital, Minneapolis.

Dr. Joseph Ryan has become a member of the staff of the Saint Paul Clinic. Dr. Ryan completed an interneship at St. Joseph's Hospital, Saint Paul, this year.

Dr. John Meade is taking a three-qear course in internal medicine at The Mayo Clinic, Rochester, following the completion of interne work at St. Joseph's Hospital, Saint Paul.

Dr. R. E. Hultkrans, secretary of the Chisago-Pine County Medical Society, has left Rush City, Minnesota, and is now associated in practice with Dr. George Dunn, Minneapolis.

Dr. William F. Schoffman is following his interneship at the Abbott Hospital, Minneapolis, with a fellowship in pediatrics under Dr. Frederic Schlutz at the Bobs-Roberts Hospital in Chicago.

Dr. Lloyd H. Ziegler resigned from the staff of the Mayo Clinic, Rochester, Minnesota, August 1, 1930, to accept the professorship of neurology and psychiatry of the Albany Medical College and to be neuro-psychiatrist-in-chief of the Albany Hospital, Albany, New York.

After completing a fellowship in Internal Medicine at the University of Minnesota, Dr. M. J. Shapiro studied at various clinics in Europe and has now returned and is limiting his practice to Internal Medicine with offices at 620 Medical Arts Building, Minneapolis.

The New York Academy of Medicine announces a series of Friday afternoon lectures of special interest to the practitioner, beginning Friday, November 7, 1930, at 4:30 P. M., at the Academy headquarters, Fifth Avenue and 103rd Street. Invitation has been extended to the profession generally.

Dr. James E. Perkins, St. Paul, has been awarded a Rockefeller Foundation Scholarship for a year's study at Johns Hopkins. Since June he has been an assistant in the Minnesota Department of Health and has obtained a year's leave of absence to enable him to pursue his post-graduate study.

Dr. Charles Remy has been selected to succeed Dr. List as superintendent of the Minneapolis General Hospital. After several years in general practice Dr. Remy obtained considerable experience in hospital administration during the World War, having been at the head of a 2,000-bed army hospital in France. After the war he was superintendent of the Yankton State Hospital for the Insane, at Yankton, South Dakota, and before coming to Minneapolis was assistant superintendent of the Michael Reese Hospital, Chicago.

DR. LIST HONORED

On Monday evening, September 29, 1930, a testimonial banquet and reception was given to Dr. and Mrs. Walter E. List at the Hotel Nicollet, Minneapolis, in recognition of the conspicuous service Dr. List has rendered to the city in the upbuilding of The Minneapolis General Hospital.

Some two hundred guests gathered in the Grand Ballroom. The Honorable William F. Kunze, mayor of Minneapolis, presided. The principal address of the evening, entitled "A Minister of Healing," was given by the Reverend Dr. Roy L. Smith. Brief speeches were made by L. N. McWhorter, of the Minneapolis Board of Education, and Paul H. Fesler, superintendent of the University Hospitals.

Dr. Francis E. Harrington, Commissioner of Health,

on behalf of friends and fellow citizens, presented Dr. and Mrs. List with a beautiful silver tea and coffee set.

Dr. Richard Olding Beard, chairman of the Committee on Arrangements, speaking in behalf of the citizens of Minneapolis, presented Dr. List with a Testimonial printed in illuminated colors and bound in a beautiful leather case.

SHORT COURSE IN TUBERCULOSIS

A one-day short course in tuberculosis is to be held at the state sanatorium at Ah-Gwah-Ching, Minnesota, November 6, 1930, in response to requests from physicians throughout the state. The short course is being sponsored by the Minnesota Public Health Association. Dr. H. A. Burns, superintendent of the Ah-Gwah-Ching Sanatorium, will be in charge.

Features on the morning's program include a paper by Dr. W. H. Ude on some phase of roentgenology in relationship to tuberculosis, a paper by Dr. E. K. Geer on "Collapse Therapy," and brief talks by Dr. B. Borreson and Dr. R. R. Hendrickson of the sanatorium staff on "Surgical Tuberculosis" and "The Incidence of Tuberculosis in Cass County," respectively.

During the early afternoon each visiting physician will study the history and make an examination of one patient. All physicians will then meet and discuss the findings. There will also be a question box and any individual problems of the visiting physicians will be discussed at this time.

This short course forms a part of the statewide Christmas Seal work. It is the third to be held at the state sanatorium. Registration is limited and those desiring to attend are urged to communicate with the Minnesota Public Health Association, 11 West Summit Avenue, St. Paul.

INACTIVE DUTY TRAINING SCHOOL, ROCHESTER, MINNESOTA, NOVEMBER 9–23, 1930

The second annual inactive duty training period for medical reserve officers will be held at Rochester, Minnesota, November 9 to 23, under the sponsorship of the Mayo Foundation; directed and personally supervised by instructors of the Medical Corps of the United States Army detailed to Rochester for the purpose. The curriculum embraces basic subjects essential to all medical officers.

The school offers opportunity for officers who have not received summer training to earn one hundred hours toward the required number for promotion at the expiration of their respective periods of appointment. The instruction covers a period of fourteen days of seven hours each. All medical reserve officers are eligible.

Any physician wishing to join the reserve corps should apply at once for a commission and when commissioned will be qualified to register for the course.

The course of instruction is arranged so as to allow visiting officers to attend clinics in the mornings and school of instruction during the afternoons and evenings.

Last year's course proved very profitable. Several officers of various branches of the regular army visited the school.

Medical reserve officers interested should write Colonel Louis B. Wilson, The Mayo Foundation, Rochester, Minnesota.

OBITUARY

M. L. Stiffler
1887-1930

Dr. M. L. Stiffler, who has been in charge of the Saint Paul Child Guidance Clinic for the past six years, died very suddenly on September 7, 1930.

Born at Bedford, Pennsylvania, forty-three years ago, Dr. Stiffler attended Oberlin College for three years and obtained his M.D. from the University of Colorado.

Following the World War, during which he served in the medical corps, Dr. Stiffler was associated with the Veterans Bureau in Minneapolis. When the Child Guidance demonstration was instituted by the Carnegie Foundation at the University, he became associated with that undertaking for two years, and in 1924, when the Saint Paul clinic was established by the Wilder Charities, he assumed charge.

Because of Dr. Stiffler's interest in children, he served as a member of the Boy Scout Council in Saint Paul. He was also a Rotarian and in college joined the Beta Theta Pi fraternity.

Dr. Stiffler died the day before the opening of the Minnesota Conference of Social Work in which he was to have taken part. He is survived by his widow, a daughter Suzanne, aged 11, and a son Charles, aged 7.

John A. Lyng
1864-1930

IN MEMORIAM

On September 27, 1930, when at his home in Minneapolis Doctor John A. Lyng was suddenly stricken dead. A good colleague and a man of more than ordinary ability was thereby removed from our profession and the ranks of organized medicine. It was the good fortune of the writer to have known our deceased colleague for many years, and in appreciation of his long friendship these obituary remarks are therefore given a more personal coloring.

Dr. John A. Lyng was born in the city of Namsos, Norway, December 25, 1864, the youngest of several sons born to a cultured and well favored family; he was educated in the schools of Norway in keeping with the ideals and cultured traditions of his family.

In the latter eighties of the past century he came to the United States of America and took up his residence in Minneapolis, where a brother of his owned and conducted a drug store. While there he entered the University of Minnesota and was graduated from its medical department in 1890, since which time he has practiced his profession in Minnesota.

Rather early he evidenced a preference for surgery

because his first appointment was that of surgeon for the Soo Railway Company. Next we find him giving his adopted country the benefit of his services during the Spanish-American War as an officer in the United States Army medical corps in Cuba.

At the conclusion of this war he returned to Minnesota and now established a successful medical practice at Alexandria and later at Fergus Falls, in both places gaining an enviable reputation as a conscientious physician and a skillful surgeon. For the last twelve years he again made Minneapolis his home, and was buried there October 1, 1930, in Lakewood cemetery, his mortal remains being escorted to their last resting place by a large throng of professional and masonic friends.

Dr. Lyng was a loyal member of our profession, continuing his membership from the Park Region Medical Society over into Hennepin County Medical Society, Minnesota State Medical Society and American Medical Association; he was also a charter member of the Thulanian Club of the University of Minnesota and a member of the Veterans of Foreign Wars.

He is survived by his wife, Else Froedtert, from Milwaukee, Wisconsin, and his son John; also a brother living in Norway and a number of more distant relatives.

From his many travels both in this country and abroad as well as from his constant studies, he remained a true scientific student all his life. Dr. Lyng had developed into a capable and sound surgeon and when he moved back to Minneapolis as before stated, it was undoubtedly with the plan and ambition of building up a surgical practice in our metropolitan sister city, and this goal not having been reached can safely be attributed to the change that took place in his health, and for a number of years caused his invalidism. A coronary arteriosclerosis with a myocardial lesion, quite often manifesting itself through very painful attacks of angina pectoris not only brought about this change in his professional career but also finished his earthly labors in the sudden manner above mentioned. And thus we mourn the loss of a proficient, upright colleague and a fellow citizen, who was rich in the profession of a strong character and a mind unafraid. "Requiescat in pace."

E. Klaveness, M.D.

George S. Davis

1845-1930

Mr. George S. Davis of the firm of Parke, Davis and Company, following a considerable period of poor health, died recently at the age of eighty-five.

A native of Detroit, Michigan, he began his career as a clerk in a retail drug store. Later he went into the wholesale drug business and in 1867 became associated with the pharmaceutical manufacturing concern of Duffield, Parke and Company. In 1871, Mr. Duffield retired and the present firm name of Parke, Davis and Company was adopted. Mr. Parke retired from active business over thirty years ago.

George S. Davis showed unusual ability in discovering, developing and organizing men, which was a big factor in the rapid expansion of his business concern. His original methods were largely responsible for the dawn of a new era in supplying the pharmaceutical needs of the medical profession.

QUEENE ELIZABETH'S MEDICINE FOR A COLDE

The following prescription apparently devised or recommended by Queen Elizabeth is taken from "A Booke of Phisicke, Surgery, Preserves and Cookery, with Sondry Other Excellent Receipts," printed about 1615.

"Take a quart of newe milke, put into it 2 sponefulls of honey, 4 ounces of linseede, and as it boyles put in peeces of scarlett or redd cloth and laye one peece on your stomack and one opposite to that on the backe, and soe goe to bedd: sweat and you shalbe well."

Despite inferences to the contrary that might be drawn from the title, the volume referred to is confined entirely to medicine and contains a very extensive and interesting collection of medical recipes including "An oyntment to anoynt the side in a Plurisy, A Sirrup for the Lungs, A purgation against Melancholly, A Remedy for them that have sore Eys, For one that cannot brooke his meat nor digest it, To help a Sciatica, &c."—*Health News,* Sept. 1, 1930.

BLACKTONGUE PREVENTIVE VALUE OF LARD, SALT PORK, DRIED GREEN PEAS, AND CANNED HADDOCK

For several years the Public Health Service has been conducting studies relating to nutritional diseases with particular reference to pellagra. A report recently made public indicates that the blacktongue preventive potency of lard, salt pork, dried green peas, and canned haddock has been studied. The results show that lard and salt pork are poor sources of the blacktongue preventive. Canned haddock contains the blacktongue preventive factor and, when used in relatively large proportion, the clinical manifestations of blacktongue are prevented. Dried green peas contain the blacktongue preventive but in relatively small amount. Fifty per cent or more of the test animals on the lard, salt pork and haddock diets showed post-mortem evidence of fatty degeneration of the liver.

METHODS OF FAVORING BILE DRAINAGE

Proprietary mixtures containing phenolphthalein, bine the experimentally demonstrated stimulants to bile secretion (salicylic acid and menthol) with the bile exinadequate) and the laxative action of phenolphthalein. The Karlsbad treatment, consisting of the ingestion of vogue some years ago. This was an attempt to comhot alkaline laxative mineral waters, is another way of aiming at the same result, which has centuries of favorable experience in its favor. Either the natural or the artificial Karlsbad salt (N.F.) may be taken by the teaspoonful to a tumblerful of hot water half an hour before the larger meals. (Jour. A. M. A., June 7, 1930, p. 1861.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

IMMUNIZATION AGAINST DIPHTHERIA

Vaccination has been accepted the world over in combating smallpox, in spite of the fact that at least every seven years the vaccination must be repeated. Immunization against diphtheria has been even more successful, because in all but exceptional cases, only a single series of inoculations is necessary. Established immunity, as proved by a negative Schick test, protects the subject for life.

In the past, most of the work in immunization has been done on the school child; children of the preschool age have been neglected to a considerable degree. Inasmuch as the passive immunity with which children are born persists about four to six months, it is evident that if all children are to be protected the immunzation against diphtheria must be carried out in the first year of life; the period of preference is from the sixth to the twelfth month. At this age the child can be inoculated with little discomfort and with few of the severe reactions that are occasionally observed in older children and adults.

The material of choice for this immunization is the modified toxin—the so-called toxoid or anatoxin. This does not require the use of antitoxin, which, in some cases at least, seems to have rendered the child susceptible to a serious reaction from later serum injections. The results have been so uniformly good, and the severe reactions in the first few years of life have been so conspicuously absent, that in this period the use of toxoid is preferable to the use of toxin-antitoxin. For older children to prevent severe reaction a preliminary test may be necessary before toxoid is used; or instead of a toxin, a toxoid combined with antitoxin made with sheep serum rather than with horse serum may be used.

Six months after the inoculation it is necessary that a Schick test be done to determine immunity, since there are a few children in each 100 who are not immune. From 95 to 98 per cent of children who are inoculated are rendered immune.

The medical profession and all public health workers are solidly behind the campaign to eradicate diphtheria, and every physician should consider it his duty to see that all children under his charge are immunized against diphtheria.

Henry F. Helmholz, M.D.

An illustrious group of names shines forth in the history of the conquest of diphtheria. We have a complete armamentarium for the eradication of this disease in civilized nations. Its virulence can be determined. Usually its lesions are easily recognized and, if not, a twenty-four hour pause for laboratory examination reveals the invader. Carriers can be identified. By the Schick test susceptibles can be isolated. The disease is so curable that it is more or less of a disgrace to lose a case. And, finally, the prevention has long been possible with the use of toxin-antitoxin. Even this has been improved and the use of toxoid makes the immunization much more definite and more easily accomplished.

It seems, however, that the medical profession of our own State has let down a little in the spreading of the propaganda of diphtheria immunization. In isolated communities a larger percentage of the children have been immunized, but the percentage throughout the State is not so great as might be desired. The material is furnished by the state. A moderate fee for doing this work is fair. If we fail to advocate and do this work, and for a moderate charge, the State will do it free. Here is one disease about which we know much and which can be prevented.

C. A. S.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

UNLICENSED DOCTOR ENTERS PLEA OF GUILTY

State of Minn. *vs.* Dufort

On October 9, 1930, J. E. Dufort of Northome, Minnesota, entered a plea of guilty before the Honorable Judge Wright of International Falls. The defendant was charged with practicing medicine without a license. Dufort has been located at Northome for the past twenty years and has never possessed a license to practice medicine in this state or elsewhere. He was arrested in 1928, charged with violating the Basic Science Law. He continued to violate the law with the result that in June 1930, he was again arrested for the same offense. The Court sentenced Dufort to a term of one year in the county jail and to pay a fine of one hundred dollars. The Court suspended the sentence on the following conditions:

1. The defendant must leave the county.
2. The defendant must refrain from practicing healing in any way, shape or manner irrespective of whether a fee is charged or not.
3. The defendant must not be charged with violation of any other statute of this state.
4. The defendant must report once every ninety days in writing to the Judge of the District Court, giving his occupation and present place of residence.

Dufort was very fortunate in escaping a jail sentence because of his previous good fortune before the Court. A number of citizens from Northome interceded for Dufort but they were warned by the Court not to interfere in this matter again. The defendant was not licensed and apparently had no chance of getting a license and will be placed in the county jail for the slightest infraction of the law. The matter was handled by Mr. Brist on behalf of the State Board of Medical Examiners.

MEDICAL ETHICS

Apropos our recent editorial on Physicians and Advertising which appeared in the October number of MINNESOTA MEDICINE, we are reproducing a letter written by the Chairman of the Publicity and Education Committee of the Hennepin County Medical Society to the Minneapolis Journal in reply to a number of editorials which have recently appeared in that newspaper. Most physicians, we feel sure, have never read the Code of Ethics which embodies the printed rules of conduct for physicians adopted by our national association. The universal rules of gentlemanly behavior which include the Golden Rule, along with local convention as to professional procedures, are sufficient for most of us. On the other hand, the presentation of the accepted Code of Ethics to new members of County Medical Societies as practiced by the Hennepin County Medical Society would be well imitated by all county organizations.—EDITOR.

To the Editor of The Journal
Minneapolis, Minnesota

Your recent editorials, "The Vagaries of Medical Ethics" and "Why Fight in the Dark," require elucidation and comment, if only because of their utter lack of any specific or constructive criticism or suggestion that might help to remedy what you seem to consider a very unsatisfactory situation.

Does it not strike you as somewhat peculiar that that "ancient relic," the medical code of ethics, has been "shot full of holes" every day at least for more than a thousand years, often by much more skillful shooters than even the editor of the Detroit Lakes Record, whom you quote, and still not only survives but thrives, naturally so since it is founded on the principles of a still more ancient relic, the "Golden Rule" which can never die?

Is not your own statement that quacks and charlatans have grown rich by advertising a very illuminating commentary on what would be sure to happen if the section on advertising was expunged from the code of ethics? Would the final result not be merely that the best advertiser and not the best doctor would sell the most medical services? In the final analysis, what has any doctor to advertise unless merely his skill? In this day and age it is not possible for any doctor, working without collaboration, to devise and use alone successfully any method, remedy, or technic which is not certain shortly to become the property of the profession at large. Medicine has ten thousand eyes and it would be a very dishonest doctor, indeed, who advertised the possession of any advantage in these regards.

Possibly there is some doctor whose skill entirely transcends the average. He has some strange intuitive power of diagnosis, some greater penetration in his look, a finer "tactus eruditus" in his finger tips. Possibly he is even the seventh son of a seventh son. But, after all, would not the advertising of such transcendant skill be repulsive to every finer instinct? And who, indeed, is to be the judge of his skill? He may be entirely over-estimating himself, probably is, and there is nothing about which the public is more easily deceived. Some of the doctors who have the largest practices are by no means the most scientific, the most skillful, the most earnestly devoted to the interests of the public itself. Even the fact that a certain doctor has apparently brought about cures where others have failed, is not of itself any certain criterion of his comparative skill.

But who constituted the State Editorial Association as the arbiter of ethics? If the State Medical Association which, by the way, has nothing to do with devising a code of ethics for the medical profession, except by virtue of its influence with, and its membership in, the American Medical Association—feels that it should delegate the revision of the code of ethics to any outside group, why, for instance, should it not choose a group from the Ministerial Association, from

the Civic and Commerce Association or from the Bar Association? Could it not delegate this to any one of these groups with a feeling that they would be at least disinterested in their consideration of the subject, whereas, if it were delegated to a group from the Editorial Association, would it not be sure that the cards were stacked at least against the section on advertising?

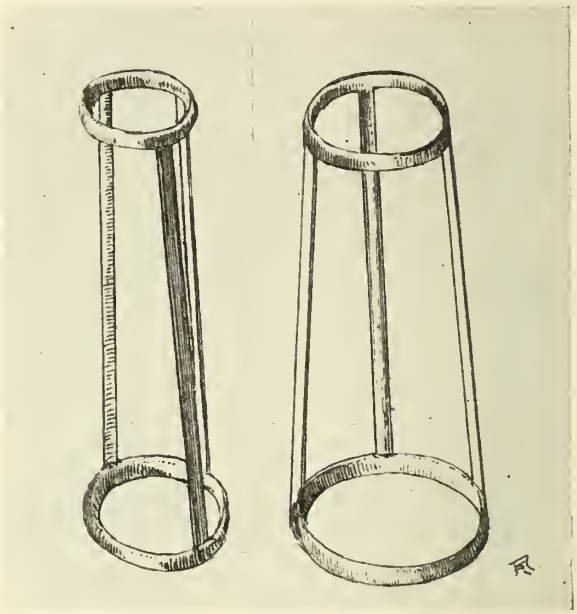
But perhaps your editorials refer, in the main at least, —though, if so, you certainly do not make it clear—to what might be called collective advertising, which after all is nothing more or less than a form of medical education of the public. The writer is a doctor, who happens to be at present, and has been for some years, Chairman of the Publicity and Education Committee of Hennepin County Medical Society, and has certainly given this matter a great deal of attention. There are very serious obstacles in the way of any such program on a large scale, though the medical profession is doing what it can under present conditions and will undoubtedly do far more in the future. Still, it may fairly enough be asked why the burden of such a program of publicity and education should fall on the medical profession at all. Why should not the burden be taken up by public institutions of education, if the work that medicine is doing is really a beneficent work and in the interest of the people? For there are, after all, only comparatively few things that it should be necessary to teach and publish—first of all, I should say, the simple rules of hygiene, with as little reference as possible to disease and its symptoms. But in the second place, people should be taught that, while even the doctors know little, in the face of the unexplored ocean of knowledge that confronts them, they still know infinitely more about the human body, perhaps even about the human mind, and certainly infinitely more about the cause, symptoms, and treatment of disease than anyone else whatsoever, and that it would, consequently, be wise for those who need help to turn to them. I would also add a third thing in which it is apparently necessary to educate the public. I refer to the origin, the growth, the scope and the purpose of the medical code of ethics, which exists for their protection and not for the aggrandizement of the medical profession.

J. A. Watson, M.D.

A NEW FINGER SPLINT

The writer recently suffered a drop-finger, due to hyper-flexion, causing a separation of the extensor tendon from the terminal phalanx. The usual splints, with adhesive, etc., were uncomfortable, uncleanly, and very bulky. I then devised a splint which possessed none of these disadvantages. This consists of two metal rings, one fitting over the end of the finger about one-fourth inch from the tip; the other, just large enough to slip over the proximal phalanx, and resting in the groove between the finger and the palm. The two rings are connected by three bars, one on each side of the finger, and the third over the dorsum of the finger. This holds the finger in fixed extension, but permits the hand to be washed, and to perform most of its usual function, without the inconveniences associated with most splints. The splint would serve as well for dislocations or fractures of the phalanges if the metacarpo-phalangeal joint does not also require fixation.

This splint was easily and inexpensively made in a



dental laboratory, the length and circumferences of the finger being first measured.

Platinoid metal was used, the parts being 1/16 inch thick, and 1/8 inch wide; the splint weighed only one-half ounce. German silver will serve equally well. While the principle of the splint is not particularly new, the writer was unable to find anything like it in the instrument houses.

Thomas Myers, M.D.
St. Paul, Minnesota.

ANTIPNEUMOCOCCUS SERUM

Antipneumococcus Serum Combining Types I and II Pneumococci, and Refined and Concentrated Antipneumococcic Serum (Lederle) Not Acceptable for N. N. R.—The Council on Pharmacy and Chemistry reports that it has accepted for New and Non-official Remedies preparation of antipneumococcic serum for Type I pneumococcus infection and that at present this is the only type in which the efficacy of serum has been sufficiently established to warrant general use. The Council reports that there is some evidence that Type II serum concentrated by the Felton method is of service if given early and in large doses, but that there are other reports which indicate inefficacy. In consideration of the present available evidence, the Council declared all serum preparations combining Type I and Type II pneumococci, including Refined and Concentrated Antipneumococcic Serum (Lederle) unacceptable for New and Non-official Remedies. (Jour. A. M. A., September 27, 1930, p. 935.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associated Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of November will be as follows:

November 5th—Poliomyelitis.
November 12th—Treatment of cataract.
November 19th—Carcinoma of the lip and mouth.
November 26th—Psoriasis.

TENTATIVE PROGRAM FOR MEETING OF MINNESOTA SOCIETY OF INTERNAL MEDICINE

Rochester, Minnesota
November 10, 1930

MORNING SESSION

"An unusual deficiency syndrome secondary to duodenal occlusion" ..... Albert M. Snell
"An unusual type of congenital heart lesion" ..... Edgar T. Herrmann
"The application of the string galvanometer to the diagnosis of adherent pericardium" ..... Morris H. Nathanson
"Transient atrioventricular conduction disturbance following strain" ..... Paul G. Boman
"What is Grace Medes Tyrosinosis?" ..... Hilding Berglund
"Subcutaneous emphysema with a case report" ..... John A. Lepak
"Tests of renal function in patients with prostatic hypertrophy with special reference to phenolsulphonphthalein" (by invitation) ..... Harold C. Habein

A synopsis of the recent symposium on renal disease at the University of Minnesota

"The features of clinical interest brought out at the Symposium" ..... Moses Barron
"The theoretical features particularly in regard to the normal and disturbed kidney function" ..... George Fahr

Discussion opened by Norman M. Keith

AFTERNOON SESSION

"The principles underlying the recent attempts at classification of arthritis" ..... Morse J. Shapiro
"Further observations on the feeding of swine in cases of pernicious anemia" ..... H. Milton Conner
"Agranulocytic angina" ..... Rudolph C. Logefeil
"The development of tuberculosis among nurses" ..... Everett K. Geer
"An unexploited therapeutic opportunity in periodic health examinations of young adults" (by invitation) ..... Norman Johnson
"A study of migraine in University students" (by invitation) ..... Lewis Daniel
"The cortical hormone of Swingle and Pfiffner in the treatment of Addison's disease" ..... Leonard G. Rowntree

Symposium on experimental peptic ulcer
Frank C. Mann (by invitation)
Edward C. Rosenow (by invitation)
George B. Eusterman

EVENING SESSION

Address—"Energy" (by invitation) ..... Charles Sheard

NORTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Northern Minnesota Medical Association, held at Moorhead, Minnesota, September 29 and 30, 1930, the following officers were elected for the ensuing year: President, Dr. B. S. Adams, Hibbing; vice president, Dr. G. S. Wattam, Warren; secretary-treasurer, Dr. O. O. Larsen, Detroit Lakes.

Hibbing was chosen for the 1931 meeting, which will be some time in August.

The meeting was addressed by Mr. Lou Beaushoop, editor of the Detroit Record, who told the ninety physicians attending the banquet at the Comstock Hotel that the medical code of ethics is "too restrictive" and that the public suffers because of the failure of reputable doctors to make full use of the press.

The Reverend Dr. Sainsbury, Fargo, also a speaker at the banquet, explained in detail England's compulsory health insurance, which creates a "consciousness of health in all minds." He, however, declared it was not likely that this system would be applicable in the United States.

Dr. H. C. Cooney, Princeton, delivered the presidential address, calling attention to the fact that the profession had made greater progress in the last forty years than in the 2,000 years preceding.

Dr. A. E. Meyerding, State Secretary, commenting on Mr. Beaushoop's address, urged newspapers to seek authentic sources for medical information in order to insure correctness and called attention to the fact that the organized profession is prepared to coöperate with the press.

O. O. Larsen, M.D.
Secretary.

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

The annual meeting of the Park Region District and County Medical Society was held in Alexandria, October 8, 1930. The following officers were elected: President, Dr. A. J. Lewis, Henning; vice president, Dr. F. Naegeli, Fergus Falls; secretary-treasurer, Dr. E. A. Heiberg, Fergus Falls.

A series of lectures on various cardiologic subjects was begun with a discussion of "The Management of

the Ambulant Cardiac Patient" by Dr. G. E. Fahr of the University of Minnesota. The Society and Auxiliary were the guests of the Park Region District Druggists Association at dinner. The non-members of the district were invited to attend this meeting, and an appeal was made to them to become active members. The Society is now conducting a Postgraduate University Extension Course, with about 30 members in attendance.

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

The annual meeting and banquet of the West Central Minnesota Medical Society was held at the Merchants Hotel, Morris, Minnesota, October 8, 1930. Dr. A. T. Arneson of Starbuck read a paper on "Blood Chemistry" and Dr. C. L. Scofield of Benson a paper on "The Relation of Physicians to the State Board of Health."

The following officers were elected for the ensuing year: President, Dr. A. E. Eberlin, Glenwood; vice president, Dr. E. T. Fitzgerald, Morris; secretary-treasurer, Dr. A. L. Lingberg, Wheaton.

The next regular meeting will be held jointly with the Kandiyohi-Swift County Medical Society at Benson.

CHARLES BOLSTA, *Secretary.*

HOUSTON-FILLMORE COUNTY MEDICAL SOCIETY

A meeting of the Houston-Fillmore Medical Society was held at Harmony, Minnesota, September 25, 1930.

A letter from Dr. Herman Johnson was read. Mr. Brist then gave a talk on the work done by the State Board of Medical Examiners which was followed by a talk on "Gastro-intestinal Diseases of Children," by Dr. Kennedy of the Mayo Clinic.

The following officers were elected: President, N. E. Anderson, Harmony; vice president, C. B. Eby, Spring Valley; secretary, R. N. Palmer, Lanesboro; treasurer, J. C. Lannin, Mabel.

Dr. William E. Johnson of Caledonia, Minnesota, was elected to membership.

J. W. HELLAND, M.D.
Secretary.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

The regular meeting of the Scott-Carver County Medical Society was held at Belle Plaine, Minnesota, on Tuesday, October 14, 1930. Dr. M. O. Henry of Minneapolis spoke on fractures and presented motion pictures of Boehler's method of treating fractures. The invitation of Dr. Fred Westerman to meet at Montgomery in November was accepted.

B. H. SIMONS, *Secretary.*

RICE COUNTY MEDICAL SOCIETY

Rice County Medical Society held a meeting Tuesday, September 23, 1930, in the main building at the State School for Feeble Minded at Faribault.

Dr. A. M. Hanson, delegate, reported on the meeting of the Minnesota State Medical Association.

Dr. D. W. Francis of Morristown read a paper on "Pneumonia."

C. J. PLONSKE, *Secretary.*

WASHINGTON COUNTY MEDICAL SOCIETY

The Washington County Medical Society held their October meeting at the Stillwater Club rooms. The guest speaker was Owen H. Wangensteen, M.D., Department of Surgery, University of Minnesota. His subject was "Cancer of the Stomach." He gave us a wonderful lecture with fine illustrations. It took him about two hours to deliver this. It was followed by a discussion or rather questions by members of the local society; the questions were very well answered. We feel that we received a great amount of valuable information and appreciate greatly Dr. Wangensteen's kindness in addressing us. Outside doctors were Dr. Simonstad and Dr. Gleeson of Osceola, Wisconsin.

E. SYDNEY BOLEYN, Secretary.

RED RIVER VALLEY MEDICAL SOCIETY

A meeting of the Red River Valley Medical Society was held at Warren, Minnesota, October 9, 1930.

The following scientific program was presented:

Sciatica—DR. A. P. MACKINNON, Winnipeg.

Fractures of the Upper End of the Femur, not including the Hip—DR. R. C. WEBB, Minneapolis.

Hip Fractures—DR. O. J. ENGSTRAND, WARREN.

Some Phases of Organized Medicine—DR. S. H. BOYER, Duluth.

Observations of European Clinics—DR. H. W. FROEHLICH, Thief River Falls.

C. L. OPPEGAARD, M.D.
Secretary-Treasurer.

LYON-LINCOLN COUNTY MEDICAL SOCIETY

At a meeting of the Lyon-Lincoln County Medical Society held in Marshall, October 1, 1930, the following officers were elected:

W. W. Yaeger, Ivanhoe, Minn.....President
E. L. Erickson, Hendricks, Minn.....Vice President
H. M. Workman, Tracy, Minn..Secretary and Treasurer
A. D. Hoidale, Tracy, Minn., ...Censor 3 years
E. L. Sanderson, Minneota, Minn.....Delegate
A. L. Vadheim, Tyler, Minn.....Alternate

The Society opened their second Clinical Course with Doctor Rood Taylor on "Pediatrics." Twenty-six were present.

H. M. WORKMAN, M.D., Secretary.

ST. LOUIS COUNTY MEDICAL SOCIETY

The annual meeting of the St. Louis County Medical Society was held Thursday, October 9, 1930, following a banquet at the Northland Country Club, Duluth, Minnesota.

The officers elected for the coming year were: President, Dr. F. J. Lepak, Duluth; vice president, Dr. T. A. Estrem, Hibbing; secretary-treasurer, Dr. Mario Fischer, Duluth.

Censors for the coming year are: J. M. Robinson, Duluth; E. L. Tuohy, Duluth, and B. F. Davis, Duluth.

Delegates to the Minnesota State Medical Association are: C. L. Haney, Duluth; B. S. Adams, Hibbing; J. R. Manley, Duluth; F. H. Magney, Duluth; Alternates—O. W. Parker, Ely; C. A. Scherer, Duluth; B. F. Davis, Duluth; A. N. Collins, Duluth.

The meeting was addressed by Dr. E. W. Sainsbury of Fargo, North Dakota, who discussed his recent travel experiences in Europe, including Russia, and certain phases of the medical economic problem in Great Britain.

M. McC. Fischer, M.D.,
Secretary.

WRIGHT COUNTY MEDICAL SOCIETY

The annual meeting of the Wright County Medical Society, and election of officers, was held at Buffalo, Tuesday, October 7, 1930.

Officers elected are: President, Dr. John J. Catlin, Buffalo; vice president, Dr. Verner P. Johnson, Delano; secretary-treasurer, C. L. Roholt, Waverly.

Dr. E. Klaveness, Monticello, was elected as delegate to the state meeting, with Dr. O. J. R. Freed, Cokato, as alternate.

John J. Catlin, M.D.
Secretary.

EPHEDRINE AND HABIT FORMATION

An article appeared in a recent issue of the Ladies Home Journal in which it was stated that ma huang is closely related to cocoa and that it is as dangerous as the narcotics of the cocoa group. It stated: "Ma huang . . . has cocaine's effects—it is exhilarating, habit forming, deadly." Chen and Schmidt in a recent monograph, "Ephedrine and Related Substances" state that investigators appear to agree that the prolonged use of ephedrine does not have any cumulative harmful effects and does not result in habit formation. In New and Non-official Remedies, no reference is made to habit-forming properties of the drug. A search of the Quarterly Cumulative Index Medicus fails to reveal published articles on ephedrine as a habit-forming drug. Though it is known that the actions of ephedrine on the central nervous system resemble considerably those of cocaine, it is not believed that these are sufficiently pleasant to be a temptation; certainly the effects cannot be at all serious, or they would have become apparent before this. In a recently published report of the effects of ephedrine on animals it is stated that in humans, after prolonged use against asthma, it produced euphoria, and reports where the drug had to be discontinued on account of unpleasant stimulation. The absence of clinical reports of addiction does not substantiate the careless references of popular writers to habit formation. The available evidence indicates that there is little if any danger of ephedrine becoming a serious habit former. (Jour. A. M. A., September 3, 1930, p. 731).

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of September 10, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, September 10, 1930. Dinner was served at 7 o'clock and the meeting was called to order by the President, Dr. Emil S. Geist, at 8 p. m. There were 42 members present.

Minutes of the May meeting were read and approved.

The Secretary also read the report of the Executive Committee meeting of August 7th and a motion was carried that this be adopted.

Upon ballot Drs. F. L. Adair and F. W. Schlutz, formerly of Minneapolis, and Dr. H. C. Cooney of Princeton were elected to Honorary Membership in the Academy, and Dr. F. F. Callahan of Pokegama Sanatorium was elected to Associate Membership.

Owing to Dr. Alexander Stewart's inability to be present, his Thesis on Serotherapy in Scarlet Fever was not read at this meeting.

Dr. A. A. Zierold (Minneapolis) then read his Thesis, entitled "Morphine as a Diagnostic Agent."

DISCUSSION

Dr. A. T. Mann (Minneapolis): I think this paper brings up a very interesting subject. I remember when I first came here the older surgeons spoke about the differentiation of rigidity by the use of morphine but they certainly did not work with it in such a careful way or go so far into its logical basis. There is a great deal of truth in the paper. I think our old idea of the withholding of morphine in abdominal conditions pivots around the fact of whether a thorough examination has been made before the morphine has been given. Personally, I can't see any reason at all for withholding morphine after a thorough and careful examination has been made and diagnostic judgment has been used. There is no doubt at all about administering morphine at that time and I think it is a very valuable thing.

Abdominal pain and abdominal tenderness are two different things. There was nothing brought out in the paper in regard to tenderness. We do get tenderness in various places from troubles at a distance. For example, we can have the tenderness that is ordinarily associated with gallbladder or with ulcer of the duodenum, from appendicitis or from an inflammation in the pelvis because of the distribution of the lymphatics. The tenderness which we ordinarily get with appendicitis comes apparently quite definitely over the first lymphatic group at the base of the mesentery, *i.e.*, under McBurney's point. The appendix travels around like the spoke of a wheel but the tenderness stays where the root of the appendix is. If that continues for some time and some of the inflammation leaks through this first bunch of glands into the next ones, which are just to the right of the aorta, then we have a second point of tenderness, Morris' point of tenderness, about one and a half inches from the midline, *i.e.*, over the juxta-aortic glands. If the inflammation trav-

els up this chain of lymphatics it may reach the upper glands of this chain at the level of the duodenum and give a deep point of tenderness suggestive of the tenderness elicited from a duodenal ulcer or sometimes that from an infected gallbladder.

The question I should like to ask the essayist is, what influence these changes would have on the abdominal rigidity and the influence of the morphine on these changes.

Dr. W. F. Braasch (Rochester): The paper this evening is a most interesting one and the Doctor is to be congratulated upon his thesis. I was particularly interested in one case in which epigastric pain was predominant and after the administration of morphine the pain was referred to the appendix. The relationship between epigastric pain and appendicitis is clearly emphasized.

As far as the urinary tract is concerned, the areas of pain reference as described by Head and others have not proven to be of value in the localization of pain. With stone in the ureter the pain is almost always referred to the renal area. After the administration of morphine the pain either remains in the kidney area or it is stopped. I do not recall any case where the renal pain was transferred to the ureter after the administration of morphine. As far as the bladder is concerned, bladder pain very seldom has to be differentiated and therefore is not strictly applicable to these theories.

Somewhat related to this subject is the work of Learmonth in disturbance of innervation of the bladder, recently published in *Surgery, Gynecology and Obstetrics*. Bladder innervation and various types of pain and disease of the bladder are discussed, together with original observations on physiology. We have observed a number of patients with unbearable pain referred to the bladder who were completely relieved by sympathectomy without disturbing the mechanical action of the bladder. The whole subject of the innervation of intra-abdominal, as well as urinary, organs is one of great interest and I believe there will be much progress made in this field.

Dr. E. L. Gardner (Minneapolis): I have seen some of Dr. Zierold's work at the General Hospital and know that it is good clinical observation. Almost twenty years ago I had the privilege of being with Dr. J. W. Bell for a while, and there were two procedures which he regularly used. One was the old-fashioned hot tub. A patient with an acute abdomen was put into a hot bath and the abdomen palpated while in the tub; this often relieved rigidity and helped to localize the lesion. The other method was to give ¼ of a grain of morphine and proceed with the examination. This diffuse type of pain and generalized rigidity seems to occur in certain high-strung individuals. Even in chronic conditions, such as in duodenal ulcer, it is not infrequent to have the primary pain referred to the upper epigastrium. Very soon, if this patient is irritable, we sometimes have a "slopping over" of pain and muscle spasm to segments above, or less often, below. By taking a very careful history in these cases we can often arrive at a pretty good diagnosis without laboratory procedures.

I think Dr. Zierold's contribution is a good one. It brings to us an old procedure better explained in modern physiologic terms.

Dr. J. S. Gilfillan (St. Paul): This paper is a very valuable one and I think it explains a little more clearly to us why we get the alteration in abdominal rigidity after giving morphine. We used to feel a little hesitancy in giving morphine in acute abdominal conditions and my own idea was that there was some danger until we had decided definitely whether or not an operation was to be done. One danger in giving morphine is to get the patient to consent to operation after you have taken the pain away. I was wondering, as I listened to the paper, if the same procedure might be applied to extra-abdominal conditions.

Dr. Zierold (in closing): You have all been very generous and I appreciate the kindly consideration that you have shown me. The questions are all very fair ones and I think can be reasonably well met.

Dr. Gilfillan commented on the possibility of using some such procedure as this in the diagnosis of joint conditions. I have been trying to check some of the chronic joint conditions but haven't enough clinical material as yet. I do know that in hip-joint disease morphine will resolve the spasm to its proper segment. I have found it to work very satisfactorily in acute joint infections, particularly in children.

Dr. Mann presented the question of pain and tenderness. I purposely avoided stressing pain and tenderness. They are more or less an incident in muscle spasm. As a result of the pain there is a purposeful spasm. The simple contraction of muscle not attended by pain is a simple reflex. As Dr. Mann so well noted, the pain and tenderness may occur in remote and rather bizarre places.

Dr. Braasch raised again that same point with regard to tenderness and brought up very aptly Head's theory in regard to referred pain, which unfortunately does not always work out. It is interesting to hear of Dr. Learmonth's work on the bladder nerves, particularly when one recalls the difficulties to be overcome.

Dr. Gardner mentioned Dr. Bell's observation, of which he had told me before and which we have discussed previously. He reiterated what I meant to say in the beginning, *i.e.*, that the clinical phase of this phenomenon is not new.

Dr. Ulrich asks as to the effect of morphine; as to whether it reduces or heightens the threshold of reflex stimulation. Morphine affects only the cortical centers. It has no effect on the spasm which is an exaggerated spinal reflex.

Dr. Wallace H. Cole reported a case of "Leg Lengthening of the Tibia in Infantile Paralysis" and showed numerous lantern slides taken before and after the operation. (This paper will be published in the December number.)

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

Meeting of October 8, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 8, 1930. Dinner was served at 7 o'clock and the meeting was called to order by chairman of the Executive Committee, Dr. F. E. Burch, in the absence of the President and Vice-President, at 8 o'clock. There were 46 members and 2 visitors present.

Minutes of the September meeting were read by Dr. Carl B. Drake, in the absence of the Secretary. These were approved.

Letters were read from Dr. F. L. Adair, Frederick W. Schlutz, of Chicago, and Dr. H. C. Cooney, of Princeton, Minnesota, each thanking the members for his election to honorary membership in the Academy. A letter was read from Dr. R. O. Beard calling attention to the meeting of the Postgraduate Assembly in the Minneapolis Auditorium, the week of October 20th and extending an invitation to attend.

Dr. H. P. Ritchie of St. Paul read the following memorial to Dr. Arthur A. Law:

Arthur Ayer Law was born at Harvard, Illinois, April 16, 1872, and died at his home in Minneapolis July 9th, 1930. He was active in attendance upon a large and select surgical practice until May, 1930, at which time some premonitory symptoms developed to a point which required a complete cessation of his work.

After graduation at the Shattuck Military Academy, he entered the University of Minnesota Medical School, from which he received the diploma of Doctor of Medicine with the class of 1894. From that time on he held a teaching position in surgery, advancing through ever increasing responsibility to that of Associate Professor of Surgery and at one time Assistant Chief of the Department. He was a prominent member of the first surgical staff of the University Hospital, which was formed upon the opening of that institution, under the masterly direction of the late Dr. James E. Moore. He took a great part in the development of the school; was positive in his opinions on policies of administration and forms of teaching, was not always in accord with others as becomes a man of individuality, but was ever constant in the hope for, and belief in, the future growth of the school; was generous of his time, tireless in effort, deep in his interest. He was always prompt to meet his lecture engagements; he was exacting in the proper care of his patients. He early developed a reputation, augmented and enhanced as the years went on, as a surgeon known for the dexterity, celerity and precision of his operative work. His association with the University continued until 1929, when upon his resignation he received from the Board of Regents an acknowledgment of his years of service, couched in positive terms of appreciation, a document of which any one would be proud and which a few are entitled to receive.

He was an officer in two wars. In the Spanish American War he was Captain and Assistant Surgeon of the 13th Regiment of Minnesota Volunteers, serving in that position during the entire term of duty with that regiment in the Philippines. In the World War he was Colonel and Commanding Officer of Base Hospital No. 26 and served in France. He received a citation from General Pershing for "service over and beyond the call of duty." This official statement is a fitting epitaph.

He had a standard of impeccable personal conduct, a strict and stern sense of responsibility of his work, a devotion for and to his family. Those who were priviliged to enter his beautiful home found in him a thoughtful, generous and gracious host. To his close friends he gave, to quote a favorite and oft-repeated expression, "a touch of the shoulder."

He was a member of other local societies and several of national scope: the American Surgical, the Western Surgical, the Southern Surgical, the American College of Surgeons, to each one of which he has presented contributions to the Science of Surgery. He was long a member of the Minnesota Academy of Medicine and upon the occasion of his death your committee offers the following resolution:

WHEREAS: Arthur Ayer Law has passed from this life, his membership in the Minnesota Academy thereby terminated and personal contact severed

BE IT RESOLVED THAT the Academy of Medicine acknowledge the years of their association, express regrets at his departure, cause the above sentiments to be spread upon the minutes and instruct the Secretary to send a copy to his family.

Signed: H. B. Zimmermann,
Martin Nordland,
Harry P. Ritchie, *Chairman.*
Committee.

The scientific program of the evening was then taken up.

Dr. J. Charnley McKinley (Minneapolis) read his thesis entitled "Familial Diffuse Sclerosis of the Brain."

Drs. F. E. Foley and Arnold Schwyzer (St. Paul) presented a paper on "An Improved Pelvioureteroplastic Operation for Hydronephrosis." Dr. Foley read the paper which was illustrated with numerous lantern slides.

DISCUSSION

Dr. H. P. Ritchie (St. Paul): The only comment which I feel qualified to make on this very excellent presentation is on the question of the flap of the pelvis. The flaps as shown appear entirely too acute. I presume this is only apparent in the illustration and not real in the operation. We know that the life of a flap is dependent on the blood supply to all parts of it. It seems to me that with all the abundant tissues of a dilated pelvis it would be just as easy to prepare the flaps in such a way as to be very sure of the maximum blood supply. I was thinking of the death of some part of the flap and an inflammatory stricture.

Dr. Foley: I would like to ask Dr. Ritchie about

what angle he would think was best for cutting the flap.

Dr. Ritchie: I suggest a little wider sweep on the tip; a curve and not such an acute angle. In skin flaps, if the flaps are too sharply cut a necrosis of the tip follows.

Dr. Foley: It would be difficult to make the point of the flap fit down onto the ureter. The flap is quite short. I would say the angle is about 60 degrees.

Dr. Ritchie: I am not familiar with the size of the flap. If it is so cut, my comment is of no value.

Dr. Schwyzer: I am very happy that Dr. Foley took the interest that he did in this procedure. If I was father of the child, he was the doctor who saved the child from the death of oblivion and has shown a modification of the procedure which in appropriate cases yields a perfect result.

In answer to Dr. Ritchie's remarks, of course we want to be sure that we have a living flap. The important feature is that the stricture is held open not by the tip, but by the base of the flap, which is at this point about one centimeter wide. Thus, even if the tip should necrose, which is has not done so far, it would be at least one centimeter away from the danger point. It is, of course, good to watch out for the proper circulation. There should not be any tension on the flap at all.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

TWO MINOR MAIL-ORDER FRAUDS

Chinese Herb Co. of San Francisco, and Webb Co., Springfield, Ill., have been debarred from the mails. The Chinese Herb Co. sold "herb treatments" through the mails for the alleged cure of practically all diseases and ailments. The Webb Co. sold through the mails a mechanical device called the "Adjustor," sold under the claim that it would develop the male sexual organ. (Jour. A. M. A., September 6, 1930, p. 745.)

VENTRICULIN

The Council on Pharmacy and Chemistry publishes a preliminary report on Ventriculin. It was presented by Parke, Davis & Co. for consideration by the Council as a preparation of desiccated stomach tissues usefui in the treatment of pernicious anemia. The Council has postponed definite action in regard to the acceptance of Ventriculin to await (1) presentation by Parke, Davis & Co. of a definitely standardized method of preparation for the product, (2) justification of the name, including a signed statement by Drs. Sturgis and Isaacs concerning the discovery of the use of stomach tissues in the treatment of pernicious anemia, and (3) presentation of adequate clinical evidence for the efficacy of the product in the treatment of pernicious anemia. (Jour. A. M. A., September 13, 1930, p. 797.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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EYE, EAR, NOSE AND THROAT

THE SINUS IN PERSPECTIVE: Arthur W. Proetz, M.D., St. Louis (Ann. of Otol., Rhinol. and Laryng., Vol. XXXVIII, No. 3, p. 682, Sept., 1930). We know discouragingly little about sinuses, and only exert a feeble influence upon their welfare.

We know, in a word, that a sinus is an air cavity communicating with the nose; that it is capable of infection and that when its ventilation and drainage are impaired trouble ensues. We know in a general way what are the symptoms of such infections and blockades, and too often we are mistaken even in these. We have devised dozens of more or less ingenious ways of opening these cavities, all for one purpose—to let out infectious material—which sums up virtually the whole of sinus surgery, and cannot be considered a step ahead of the elementary surgical principle of draining an abscess anywhere in the body, as practiced by the ancients. Our treatment plays a pathetic role in the process of repair which Nature institutes and effectively pursues.

Naturally it must remain for the few to make the

epochal discoveries upon which a science grows, but at the same time it is the responsibility of the many to unburden themselves of the charms, curses and fetishes of the past, and to familiarize themselves in extenso with the underlying facts of physiology and pathology. The mere mention of swollen membranes is a red rag to some of us. Swollen ankles merit only passing attention. Pus encountered in the nose is a fair indication that nature is at work successfully expelling noxious agents from our confines, and while I do not view it as a signal for jubilation I see no occasion for hysteria in regard to it.

I am increasingly impressed with the probability that the chronicity of many sinus infections depends not upon the failure of the body to throw off some old initial infection, but upon the daily reinfection with some strain of microörganism to which the subject is nonresistant. It is as though the patient were taking daily some noxious drug which was discontinued for a time and later resumed. To my mind this explains the sophistry "once a sinus always a sinus" which the laity now sententiously quote. Unfortunately it comes too near the truth, which is my one excuse for this diatribe.

I spend sleepless nights thinking about the physicians of old contemplating arteries and the spurting of blood for centuries before they sensed the secret of the circulation. Fifteen hundred years elapsed before curiosity supplanted reverence for authority and amended the quaint physiology of Galen. I realize what remains to be done for sinuses, and pray that no such centuries will pass before some scientific light is thrown upon these dark cavities which lie above and beside and behind—not to say under—our very noses.

Arthur C. Dean, M.D., F.A.C.S.

BRAIN ABSCESS FROM THE STANDPOINT OF THE OTOLARYNGOLOGIST: Wells P. Eagleton (Trans. Amer. Acad. Ophth. and Otolaryngol., Page 64). There is a direct relationship between the intermedullary blood supply and the meninges, as every cerebral vessel is surrounded by a prolongation of the pia arachnoid to form a perivascular space. This makes for an easy route of infection for the formation of brain abscess. Added to this, all the veins within the dura have no outer coat; the walls are simply a layer of endothelial cells. The place of the outer coat, the adventitial coat of the extra-dural veins, is formed by the perivascular space prolongation. In this way venous channels and perivascular spaces are the chief routes of infection in brain abscess, originating from a retrograde thrombophlebitis or a perivascular space invasion. A chill differentiates between these two.

Infarcts occur frequently and many are not recognized as patients recover if the vascular occluding nidus is not infected or when the infection is overcome by the protective reaction of the surrounding arachnoid. Some of these cases cause a suppurative meningitis, and others remain quiet for a long time, and then develop an abscess.

Subdural space abscesses occur frequently, especially over the frontal lobe, making up about 25 per cent of these cases. They are easily missed if exploration takes place through too small an opening. In the temporo-sphenoidal lobe they are uncommon, but are fairly frequent over the tentorium, under the occipital lobe. All cases of infection through the ductus endolymphaticus are in reality intradural abscesses, which are apt to become subdural space collections. If these are diagnosed early and operated upon, a high percentage of recoveries should be obtained. This form of abscess is apt to result when the superior semi-circular canal has been eroded or following a mastoidectomy, during which there has been injury to the dura. All these cases require a large dural incision.

Aids to Diagnosis in Brain Abscess.—1. Careful notes should be made, in doing every mastoid operation, of any abnormalities, for, later, if any intracranial involvement occurs, the focus and its means of spreading anatomically may be understood.

2. If the labyrinth has recently ceased to function the path of infection is likely through it, and has entered the dura through the internal auditory meatus.

3. A patient with a suppurating ear, who vomits without any manifest reason, is experiencing some sort of dural involvement.

4. Routine visual fields should be taken daily, as they may vary greatly. They can only be taken early, when the patient is able to coöperate.

5. The value of nystagmus. In intracranial lesions, one should forget much that has been taught, as to the localizing value of the direction of the nystagmus. A few points are of much value as: (a) a vertical nystagmus either spontaneous or induced suggests a brain stem involvement, (b) a changing spontaneous nystagmus suggests a retro-labyrinthine involvement, (c) a vertical diplopia associated with or followed by a spontaneous nystagmus suggests a deep, mid-brain collection in the anterior segment of the posterior fossa.

Do not do a spinal puncture in any case of abscess suspected to be in either the posterior fossa or any part of the mid-brain cone.

Do not administer ether when unnecessary.

Operative Results.—There has been on appreciable improvement in results in cases of temporo-sphenoid abscess. The results in cerebellar abscess have improved probably due to the increased area of bony decompression as done at present. In cases of intradural suppuration of the frontal region, there has been a marked improvement.

L. G. Flanagan, M.D.

APPENDICITIS FOLLOWING TONSILLECTOMY: H. C. Ballenger (Arch. of Otolaryn., July, 1930, p. 67). Appendicitis following tonsillectomy is apparently not common, judging from the literature, as a careful search failed to reveal any cases reported. That such a relationship may exist is probable, for during recent years it has become increasingly evident that appendicitis or peritonitis may follow acute or chronic tonsillitis. In 1916 Anderson reemphasized the apparent relationship between infection of the upper respiratory tract and that of the appendix. Such a

relationship is suggested by the similar lymphoid tissue in the two structures and by the frequently noted incidence of appendicitis during an epidemic of throat infections.

Evans reported eight times as many cases of appendicitis during the time of an epidemic as when there was no epidemic. He found an infection of the upper respiratory tract in 86 per cent of his cases of appendicitis.

Nearly all observers are convinced that this relationship exists. However, the method by which the transmission of the infection from the throat to the appendix occurs is not so clear; whether the bacteria are carried by the alimentary canal, the lymph system or the blood stream is still a matter of question. Possibly all three channels are used at times.

That the infection may be transmitted by way of the alimentary tract was demonstrated by Chastenet, who obtained a subsequent appendicitis in rabbits by feeding them with pathogenic bacteria. In many cases the infection is transmitted by way of the blood stream. Poynton and Payne reported a case in which they seem to prove almost conclusively that a cause of appendicitis may be a streptococcal invasion through the blood stream from follicular tonsillitis.

The removal of the tonsils and adenoid may possibly be a factor in producing or inciting appendicitis in view of the generally accepted opinion that appendicitis is frequently a result of acute or chronic tonsillitis.

Gerald M. Koepcke, M.D.

GYNECOLOGY AND OBSTETRICS

EXTEMPORANEOUS EVACUATION OF THE UTERUS UNDER SPINAL ANESTHESIA: Paul Delmas (Bul. Soc. Gynec. et Obstet., April, 1928, p. 413). The author describes his method of emptying the uterus at an appointed time, without operative or accidental laceration of soft parts.

He believes that spinal anesthesia: (1) prevents contracture or tetanic contraction of the uterus; (2) does not interfere with normal uterine contractions; in fact, that these are actually stimulated.

He explains that the posterior nerve roots are impregnated with the anesthetic, thus breaking the reflex arc and forming a physiologic block to the conduction of painful stimuli from the genital tract. The intrinsic nerve supply is not affected, so normal contractions take place with no inhibition from the central nerve system.

He uses an adequate dose of anesthetic dissolved in cerebrospinal fluid. Dilatation is rapidly accomplished manually, and either forceps or version selected on basis of obstetrical indications. The method was used in about 5 per cent of the cases in his institution and results were uniformly satisfactory. The third stage was usually physiological. Uterine retraction was uniformly spontaneous and adequate.

As contra-indications he recognizes: Operative or traumatic scars of the cervix; inflammatory or cautery cicatrix; malignant disease of the cervix; tetany or contracture of the uterus or cervix.

He has used the method for the following conditions: To induce labor prematurely in case of contracted pelvis, or for at term hydramnios or prolonged pregnancy; toxemia or eclampsia; premature rupture of membranes; placenta previa; during labor in case of undue delay.

A. L. McDonald, M.D.

ERGOTISMUS GANGRENOSUS: Philip Oginz (Amer. Jour. Obstet. and Gynec., Vol. XIX, No. 5). Serious cases of ergot gangrene are rarely reported. The author furnishes details concerning a patient who received a single dose of fluid extract of ergot following labor. Then, because of sepsis, she was given "Gynergen" by hypo every four hours over a period of ten days. Numbness and tingling of the feet and limbs suggested a diagnosis of saddle thrombus of the common iliac, and surgical intervention was seriously considered. Finally ergot poisoning was diagnosed and the drug discontinued. The condition cleared but only with the loss of all toes of the right foot. Idiosyncrasy to ergot should always be considered and long continued medication with ergot avoided.

A. L. McDonald, M.D.

A TEST OF LABOR: John M. Lafferty (Amer. Jour. Obstet. and Gynec., Vol. XIX, No. 5). The author adopted the test described by Tweedy, which includes: A record of the maternal temperature and pulse, and of the fetal pulse every two hours. A rise of the maternal pulse or temperature above 100 indicates interference on behalf of the mother.

A fetal pulse over 160 or under 120, recorded at three successive counts at one minute intervals, requires interference for fetal distress.

The findings of this test were applied to a series of 822 labors with operative interference in 14.7 per cent. The author feels that the test is a reliable guide, inspires confidence during slow labors, and rarely fails to warn of danger in time for intervention. In his experience it has prevented many unnecessary operative deliveries, and has often furnished the only indication of fetal distress.

A. L. McDonald, M.D.

PEDIATRICS

POLIOMYELITIS: George A. Campbell, M.B., and Samuel Mirsky, M.D., Ottawa, Ontario (Arch. of Ped., September, 1930, Vol. XLVII, No. 9). In 1913, Flexner and Noguchi isolated the etiological factor and demonstrated it to be a filter-passing virus and not a bacterium.

Sixty per cent of the cases occur in males. Sixty per cent of the cases are under five years of age, and 95 per cent under ten years in recent epidemics. A second attack is unknown. The period of greatest infectiousness is during the first three or four days of the acute disease.

Three types of cases are recognized:

1. The abortive type.
2. Dromedary type.

3. The acute type, in which the nervous system becomes involved while the general infection is at its acute stage.

Spinal fluid examination is usually helpful in the diagnosis, but renders no aid in differentiating poliomyelitis from encephalitis.

Cells: 50 to 2,000—average 150 to 300. The cerebrospinal fluid is normal in the abortive case and during the first febrile disturbance of the dromedary type. There is usually a leukocytosis of 15,000 to 30,000.

The use of convalescent serum is based on two conclusive experiments of Flexner and his associates, which demonstrate that the potent virus of poliomyelitis is rendered innocuous when mixed with convalescent serum, and that administration of the serum, as late as 24 hours after the monkey has been inoculated with the virus, will prevent the development of paralysis.

The importance of diagnosis in the pre-paralytic stage is emphasized because the intramuscular exhibition of convalescent serum at this stage seems to prevent paralysis.

R. N. Andrews, M.D.

ACUTE OBSTRUCTIVE LARYNGITIS: William L. Bradford, M.D., and Alice D. Leahy, B.S., Rochester, N. Y. (Am. Jour. of Dis. of Children, Volume 40, Number 2). While bacillus diphtheriæ is the most common cause of this condition, there is no doubt that many cases are diagnosed as laryngeal diphtheria which are actually due to some other organism.

The clinical manifestations of diphtheritic and of nondiphtheritic laryngitis are so similar that the actual diagnosis frequently depends on the results of bacteriologic cultures.

The chief symptoms and the number of persons manifesting them were as follows: diphtheritic—difficult breathing, thirty-three; cough, twenty-two; fever, thirteen; hoarseness, fourteen; cold, fifteen; croup, eleven; sore throat, eleven; restlessness, six; vomiting, eight; nondiphtheritic—difficult breathing, twenty-five; cough, eighteen; croup, seventeen; fever, seventeen; sore throat, seven; cold, six; restlessness, four; vomiting, nine.

Stridor, retraction of the chest with increased respiratory rate, cyanosis and the presence of a membrane were the outstanding signs among the diphtheritic group.

Ten of eleven fatal cases of diphtheria and six of seven non-diphtheritic patients were examined anatomically. In the first group, typical diphtheritic membranes were demonstrated, with the recovery of Bacillus diphtheriæ in culture in each case. Secondary lobular pneumonia was present in each case. None showed definite myocarditis.

In the nondiphtheritic cases, postmortem examination revealed edema, injection and granulation of the laryngeal and tracheal mucous membranes. No definite membranes were found, but in all cases considerable mucoid exudate was present in the bronchi. Each case presented definite lobular pneumonia. In this group of cases, cultures from the trachea and lungs were negative for Bacillus diphtheriæ.

The evidence in a study of this group of cases strongly suggests that they were severe types of acute catarrhal laryngitis rather than hemolytic streptococcic infections. In this group of cases the predominating organism found by poured blood-agar plate cultures from the larynx was a green-producing streptococcus. Hemolytic streptococci were insignificant in this series of cases. From the bacteriologic study of this group of cases, it is suggested that green-producing cocci may be of etiologic significance in certain types of acute obstructive laryngitis simulating laryngeal diphtheria.

R. N. Andrews, M.D.

THE DIAGNOSTIC VALUE OF SODIUM FLUORESCEIN IN EPIDEMIC CEREBROSPINAL MENINGITIS: Barnet E. Bonar, M.D., Salt Lake City, and Lyle G. Bailey, M.D., Millwood, Wash. (Amer. Jour. of Dis. of Children, Sept., 1930, Volume 40, Number 3). Sodium fluorescein is a dyestuff that has been used to determine the permeability of the meningeal barrier in health and in disease. Jervell demonstrated that the presence of sodium fluorescein in the spinal fluid within three hours after oral administration was indicative of meningitis, and that inability to detect the presence of sodium fluorescein ruled out the disease.

In 19 cases out of 21 of epidemic cerebrospinal meningitis, the sodium fluorescein test performed early in the course of the disease or before cure was established gave positive results. The absence of positive results in the globulin and sodium fluorescein tests indicates that the meningeal infection was of too short a duration and too slight a degree to give changes of the spinal fluid in the two cases. Both cases died early.

The fact that the concentration of sodium fluorescein was slight in some cases, whereas after treatment the reactions became stronger, suggested the possibility of irritation by the serotherapy increasing the permeability of the meninges.

Ordinarily, the finding of blood in the spinal fluid at puncture makes the fluid nearly valueless for diagnosis. Sodium fluorescein is nonpoisonous, and should not be confused with uranium, which is destructive to the tissue of the kidneys especially.

The test is of value in the differentiation of epidemic cerebrospinal meningitis from other diseases in which sometimes there are manifestation of meningeal irritation, such as pneumonia, erysipelas, spasmophilia, encephalitis, tumor of the brain and tetanus. The presence of small amounts of blood does not invalidate the test, which makes it especially valuable in the diagnosis of meningitis.

R. N. Andrews, M.D.

THE CHILD'S HEART IN HEALTH AND DISEASE: Ronald L. Hamilton, M.D., Sayre, Pa. (Arch. of Ped., Vol. XLVII, No. 7, July, 1930.) A survey of the vital statistics collected during the past decade has demonstrated to us that heart disease is playing the major role in our death rate.

Should we, up to six weeks, examine the infant's

heart we would find a definite right auricular enlargement, which is physiologically normal. Murmur and thrills may be apparent the first few weeks of life, but these should soon disappear.

All children born with cyanosis are not necessarily congenital heart abnormalities, as enlarged thymus, atelectasis of lungs, cerebral hemorrhage, or sepsis may cause the same. The cyanotic group are principally those of pulmonary stenosis, or pulmonary stenosis and atresia. It is extremely important that we diagnose correctly congenital heart disease from organic heart disease.

Patent foramen ovale: Here we should expect little, if any, diminished life expectancy. Ventricular defects are not incompatible with long life, even though they may be complicated with a patent ductus arteriosus. Atresia of pulmonary artery demands a guarded prognosis.

Treatment consists of care in the avoidance of infection, and the mapping out of a good hygienic regime to be followed by the patient. We should be more optimistic in our outlook and remember that the significant aspect of the case is the ability of the heart to work. Even extreme cyanosis should not necessarily influence us to take a too pessimistic view.

Most important are the groups with acute rheumatic fever, chorea, tonsillitis, and those of growing pains. The earliest signs of heart involvement resulting from the above diseases are as follows:

a. A slowing of the heart manifesting a delayed conduction time from auricle to ventricle.
b. An excessive and persistent tachycardia found early.
c. A dropped beat (not a premature beat).
d. A complete transient heart block.
e. Enlargement of the heart.
f. Development of a heart murmur.
g. Pericardial effusion, and at times friction rubs.

Acute rheumatic fever and allied diseases, manifested at times only by growing pains, must be appreciated by the physician as being of significance. Investigators have recently proven that infection may remain in the body, mildly active or in a quiescent stage, from three to five years. A child developing either of these diseases should be kept under the watchful eye of a physician for at least five years, even though convalescence appears to have been uneventful and complete. Good common sense is the greatest asset of the physician in this estimation of activity. Salicylates by mouth (and if gastro-intestinal disturbance, then by rectum) are probably the most important of all medicinal methods of treatment.

Acute infectious disease means potential heart disease. Acute rheumatic fever always means heart disease. Therefore, in infectious diseases, place the heart in its best possible state to resist infection. Never overstimulate a heart that is functioning to capacity—for whipping a tired horse leads but to disaster.

R. N. Andrews, M.D.

NEW AND NON-OFFICIAL REMEDIES

The Council on Pharmacy has accepted the following articles:

Aces Laboratory, Inc.
Mercurochrome Suppositories-Aces

Cutter Laboratory.
Diphtheria Toxoid-Cutter, 45 c.c. vial

Hoffmann-LaRoche, Inc.
Synthetic Thyroxine
Ampuls Synthetic Thyroxine-Roche, 1.1 c.c.
Solution Synthetic Thyroxine-Roche
Tablets Synthetic Thyroxine-Roche, 1 mg.

International Vitamin Corporation
I. V. C. Vitamin Concentrate of Cod Liver Oil

Eli Lilly & Co.
Amytal
Pulvules Sodium Amytal, 3 grains
Old Tuberculin, Human Strain, Concentrated, 2 vial packages

McKesson & Robbins, Inc.
McKesson's Vitamin Concentrate of Cod Liver Oil

E. S. Miller Laboratories, Inc.
Ampoule Sterile Solution Dextrose, U.S.P., 5 Gm., 10 c.c.
Ampoule Sterile Solution Dextrose, U.S.P., 10 Gm., 20 c.c.

National Drug Co.
Antimeningococcic Serum

Parke, Davis & Co.
Gas-Gangrene Antitoxin (Combined) Refined and Concentrated
Soluble Gelatin Capsules, Parke, Davis & Company's Standardized Cod Liver Oil.

Plant Products Co.
Plant's Magnesia Wafers

G. D. Searle & Co.
Chiniofon-Searle
Tablets Chiniofon-Searle, 0.25 Gm. (4 gr.)

C. M. Sorensen Co., Inc.
Inhalant Chloretone Creosote and Eucalyptol-Sorensen

Spicer & Co.
Tartro-Quiniobine
Tartro-Quiniobine Ampules, 2 c.c.

White Laboratories, Inc.
White's Cod Liver Oil Concentrate

Winthrop Chemical Co.
Ampules Emulsion Mesurol, 20 per cent, 1 c.c.
Mesurol
Theocin
Tablets Theocin, 1½ grains

Nonproprietary Articles
Quinine Bismuth Iodide
Sodium Potassium Bismuthyl Tartrate

The following articles have been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1930, p. 477):

H. K. Mulford Co.

Pollen Extracts Diagnostic-Mulford

C. M. Sorensen Co., Inc.

Inhalant Pine Camphor and Eucalyptol-Sorensen

TRUTH ABOUT MEDICINES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

Alphanaphthol.—The actions of alphanaphthol resemble those of betanaphthol. The literature is rather contradictory and unsatisfactory as to the relative toxicity, but it is probably of a similar order. Alphanaphthol is employed locally as an antiseptic and germicide; it is not generally used internally.

Alpha Naphco.—Compound Solution of Alphanaphthol. Alpha Naphco contains alphanaphthol 10 Gm., glycerin 32 Gm., soft soap 23.8 Gm., water to make 100 Gm. When tested against *B. typhosus* by the U. S. Hygienic Laboratory method, alphanaphco has a phenol coefficient of 1.46. Carel Laboratories, Redondo, California.

Pyridium.—Phenylazo-2-6-diamino-pyridine monohydrochloride. The monohydrochloride of an azo dye of the pyridine series, phenylazo diamino-pyridine. Pyridium has marked penetrating power and is nontoxic and non-irritant in therapeutic dosage. It is rapidly eliminated through the urinary tract. It is bactericidal in aqueous solution against staphylococcus, streptococcus, gonococcus, *B. coli* and even *B. diphtheriae.* It is proposed for use in gonorrheal infections, urinary diseases, and in colon bacillus and mixed infections. The drug is supplied in the form of Aqueous Solution of Pyridium, 1 per cent; Pyridium Ointment, 10 per cent; and Pyridium Tablets, 0.1 Gm. Merck & Co., Inc., New York.

Pollen Antigens-National.—Liquids obtained by extracting the dried pollen of plants with a 0.5 per cent sodium chloride solution containing sodium bicarbonate and phenol. For a statement of actions and uses, see Allergic Protein Preparations, New and Non-official Remedies, 1930, p. 23. Pollen Antigens-National are marketed in packages of one 5 c.c. vial containing respectively 50, 100 and 250 units per c.c. The following products have been accepted: Ragweed Pollen Antigen-National and Timothy Pollen Antigen-National National Drug Co., Philadelphia. (Jour. A. M. A., July 5, 1930, p. 35.)

Mead's 5 D Cod Liver Oil with Viosterol.—A brand of cod liver oil with viosterol 5 D (N. N. R.). For a discussion of the actions and uses of cod liver oil with viosterol 5 D, see New and Non-official Remedies 1930, p. 257. Mead Johnson & Co., Evansville, Indiana.

Siomine.—Hexamethylenetetramine tetraiodide. Siomine contains 78.5 per cent of iodine. Siomine is decomposed in the intestine with formation of hexamethylenetetramine and iodide, the rate of absorption and excretion being essentially the same as that of inorganic iodides. It therefore produces the effects of ordinary iodides, from which it differs only in that it can be administered in solid form. No therapeutic claims are made for the hexamethylenetetramine component of siomine, this being present only to render the substance insoluble. The dosage is the same as that of potassium iodide. Siomine is supplied in the form of capsules containing respectively ½ grain, 1 grain, 2 grains, and 5 grains. Pitmanmoore Co., Indianapolis.

Ephedrine Nasal Jelly-Maltbie.—It is composed of ephedrine sulphate-N. N. R. 1 per cent, menthol 0.25 per cent and sodium benzoate 0.5 per cent in a glycerite of tragacanth base. For a discussion of the actions and uses of ephedrine sulphate, see New and Non-official Remedies, 1930, p. 167. Maltbie Chemical Co., Newark, New Jersey.

Ephedrine Hydrochloride-P. D. & Co.—A brand of ephedrine hydrochloride-N. N. A. For a discussion of the actions and uses of ephedrine hydrochloride see New and Non-official Remedies, 1930, p. 167. Ephedrine hydrochloride-P. D. & Co. is supplied in the form of capsules containing respectively ⅜ grain and ¾ grain. Parke, Davis & Co., Detroit.

Elixir of Pyramidon.—Each 4 c.c. (1 fluidrachm) contains pyramidon (New and Non-official Remedies, 1930, p. 314) 0.162 Gm. (2½ grains) in a menstruum containing alcohol, 20 per cent. H. A. Metz Laboratories, Inc., New York.

Pyramidon Tablets 1 1/2 grains.—Each tablet contains pyramidon (New and Non-official Remedies, 1930, p. 314) 1½ grains. H. A. Metz Laboratories, Inc., New York.

Thio-Bismol.—Sodium Bismuth thioglycolate. A salt formed by the interaction of sodium thioglycolate and bismuth hydroxide containing approximately 38 per cent of bismuth. Thio-bismol is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis (Bismuth Compounds, New and Non-official Remedies, 1930, p. 94); it is a water-soluble compound, readily absorbable, and produces relatively little local injury. The product is supplied in the form of ampules containing 0.2 gm. of thio-bismol. Parke, Davis & Co., Detroit. (Jour. A. M. A., July 19, 1930, p. 200.)

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Heinz Rice Flakes Prepared with Pure Rice Cellulose (H. J. Heinz Co., Pittsburgh).—A flaked rice containing added rice cellulose, yeast, salt and milk sugar. Milled rice, rice cellulose (7 per cent of weight of rice), yeast (7 per cent), table salt (2.75 per cent), and milk sugar (0.5 per cent) are cooked, dried, flaked, toasted, cooled and packed. The product is a breakfast cereal containing indigestible cellulose that is claimed to be less irritant than wheat bran. It is proposed for use in an anticonstipative diet.

Ry-Krisp (Ralston Purina Co., St. Louis).—A whole rye grain wafer flavored with salt. Ry-Krisp may be

used in cases of wheat allergy. The wafers encourage thorough chewing.

Merrell-Soule Powdered Skim Milk (The Borden Co., New York).—A standard, uniform, practically fat-free, powdered skim milk. It contains fat 1.0 per cent, protein 36.5 per cent, lactose 51.8 per cent, mineral matter 7.9 per cent, moisture 2.5 per cent. The product is offered as a near approach to a fat-free milk.

Curtice Brothers Certified Nursery Foods (Curtice Bros. Co., Rochester, N. Y.).—Sieved spinach, carrots and tomato, and vegetable purée. The water content approximates that of the raw vegetables. These foods are stated by the manufacturer to be especially prepared for babies and young children. The manufacturer guarantees a declared minimum number of units of Vitamins A, B and C. This information is declared on the label of the cans.

Alp Rose Canned Foods (John Sexton & Co., Chicago).—These are canned fruits and vegetables, packed in water without added sugar or salt, and intended for use in restricted diets. The label declares the average composition for available carbohydrates, protein and fat.

Van Camp's Puréed Fruits and Vegetables (Van Camp Packing Co., Indianapolis).—These include purées of peas, spinach, tomatoes, prunes, apricots, carrots with puréed tomatoes and beef broth, and mixed vegetables with beef broth. These foods are designed by the manufacturer to influence the greater use of certain vegetables of good nutritional value. They are intended to provide them in smooth diet form and are chosen for their vitamin values. (Jour. A. M. A., August 16, 1930, p. 485.)

Sun Wheat Biscuits (Canada Biscuit Co., Ltd., London, Ont.).—A wheat biscuit with unusual vitamin and calcium content.

Sunwheats (The Sawyer Biscuit Co., Chicago).—Sunwheats is the brand name for Sun Wheat Biscuits manufactured for distribution in the United States.

Kiddie Kanned Vegetables, Fruits and Cereals (Kiddie Kanned Foods, Inc., Seattle, Wash.).—Canned cooked and sieved vegetable soup, oat porridge, wheat porridge, spinach, tomatoes, carrots, apples and peaches. They contain no added salt or sugar. To prepare these products the vegetables and fruits are washed, cooked under pressure to soften for sieving. The hot sieved foods are packen in cans, sealed and processed. Crushed oats and wheat are cooked under pressure, sieved, packed hot, and processed.

Horlick's Malted Milk Lunch Tablets (Plain and Chocolate Flavored) (Horlick's Malted Milk Corporation, Racine, Wis.).—These are Horlick's Malted Milk, plain and chocolate flavored, compressed into tablets. (Jour. A. M. A., September 20, 1930, p. 865.)

Horlick's Malted Milk (Horlick's Malted Milk Corporation, Racine, Wis.).—The product is a dried milk and extract of malted barley and wheat. Horlick's Malted Milk is claimed to be a nutritious food and when taken hot before retiring to be helpful for inducing sleep, and to be valuable in diets for undernourished, nervous patients, those afflicted with wasting diseases, invalids and convalescents.

Horlick's Sweet Chocolate Flavor Malted Milk (Horlick's Malted Milk Corporation, Racine, Wis.).—The product is Horlick's Malted Milk flavored with cocoa. Its composition is essentially that of Horlick's Malted Milk.

Grape-Nuts (General Foods Corporation, New York; Postum Co., Inc., Battle Creek, Mich.).—A breakfast cereal of whole wheat and malted barley. The manufacturer offers Grape-Nuts as an energy food providing proteins, the mineral elements of wheat and barley, and Vitamin B. (Jour. A. M. A., August 23, 1930, p. 595.)

ACCEPTED DEVICES FOR PHYSICAL THERAPY

The following have been accepted by the Council on Physical Therapy of the American Medical Association for inclusion in its list of accepted devices for physical therapy:

Austin's Irrigators.—Austin's Irrigators (W. D. Peattie, Inc., Cleveland, Ohio) are designed for "dilating the sphincter muscles" and "for continuous irrigations," particularly in "the use of extreme temperatures in (irrigating) liquids." It is claimed for the apparatus (1) that complete dilation and thorough cleansing is accomplished; (2) that the vaginal types permit long uninterrupted douching; (3) that the rectal types permit long uninterrupted irrigation; (4) that they are made of material which permits the use of irrigating liquids of high or low temperature; (5) that the apparatus may be taken apart and sterilized thoroughly; (6) that it is easily tolerated by the patient; (7) that any soluble antiseptic may be used; and (8) that the irrigators or tips can be made a part of any irrigating apparatus. The Council on Physical Therapy believes that these claims are reasonable and not unwarranted. (Jour. A. M. A., August 2, 1930, p. 343.)

Sorensen Therapeutic Inhaler No. 922.—The Sorensen Therapeutic Inhaler No. 922 (C. M. Sorensen Co., Inc., Long Island City, N. Y.) is stated to be an electrical instrument giving warm, dry air for the vaporization of inhalants. The device is constructed to heat air in sufficient volume to permit of deep and continued breathing direct from the applicators, thus providing the mucosa with a continuous supply of warm air or of warm medicated vapor. It is designed to operate on a 100 to 125 volts, alternating or direct current, and its power consumption is less than 15 watts.

Sorensen Therapeutic Heater No. 921.—The Sorensen Therapeutic Heater No. 921 (C. M. Sorensen Co., Inc., Long Island City, N. Y.) is similar to the Sorensen Therapeutic Inhaler. It is different in that the cold air, instead of being drawn through a heating chamber, is forced through by some type of air compressor. It is claimed to be of value in the treatment of those diseases of the middle ear where the application of warm, dry air, or warm medicated vapor, is indicated. (Jour. A. M. A., August 9, 1930, p. 413.)

Sunlit Ultraviolet Glass.—The window glass known as "Sunlit" (Semon Bache & Co., New York) is stated to be a glass that transmits the biologic ultraviolet rays of the sun. According to a test conducted by the Bureau of Standards this glass does transmit an appre-

ciable percentage of the solar rays which have been shown to have antirachitic properties. (Jour. A. M. A., August 16, 1930, p. 484.)

Maltese X-ray Lead Glass.—Maltese *X*-ray Lead Glass (Semon Bache & Co., New York) is a lead glass designed for *x*-ray protective shields. Measurements of the protective qualities of several samples were made by the Bureau of Standards and were satisfactory. (Jour. A. M. A., September 20, 1930, p. 865.)

The Davis Inhalator.—The Davis Inhalator (Bullard-Davis, Inc., New York) is a portable apparatus designed to assist physicians in the administration of oxygen or a mixture of oxygen and 5 per cent carbon dioxide in resuscitation in various forms of asphyxia. Compressed gases are contained in tanks and by a reducing valve may be delivered at the desired pressure through a breathing bag and mask as demanded by artificial or natural breathing of the patient. The apparatus meets the requirements for inhalators of approved standard and incorporates devices which make for flexibility, adaptability and safety. (Jour. A. M. A. July 19, 1930, p. 200.)

Comprex Electro-Cautery and Diagnostic Light (Comprex Oscillator Corporation, New York).—A device for cauterization by means of electrodes which are electrically heated to the desired temperature. The device consists essentially of a transformer, designed to operate on either a 110 or 220 volt, 60 cycle alternating current circuit. The transformer is also tapped at such point as will give the desired voltage for the operation of a diagnostic light.

"Stoppollen" Air Filter (Davies Air Filter Co., New York).—A simplified portable filter which delivers dust- and pollen-free air. The apparatus is described as consisting of a cabinet rectangular in shape, which contains the filter screen, a pressure fan and an electric motor, and is so constructed as to fit into any sized window. The cost of operating the device continuously for twenty-four hours is about ten cents. Tests were conducted which demonstrated that the Stoppollen air filter was efficient as a means of keeping a room free from dust and pollens. (Jour. A. M. A., May 31, 1930, p. 1760.)

Scillaren-B.—The amorphous component of the natural mixture of the glucosides occurring in squill, *Urginea maritima.* Completely dried scillaren-B contains approximately 99.5 per cent active glucosidal substance. Scillaren-B dried in a high vacuum at 78° C. for fifteen hours loses not more than 5 per cent of its weight. The actions and uses are the same as those of scillaren. It is administered intravenously when immediate action is imperatively indicated. Scillaren-B is marketed in the form of ampules each containing 0.5 mg. (1/130 grain) of scillaren-B. Sandoz Chemical Works, Inc., New York.

Ampoules Glucose (Dextrose, U.S.P.) Lilly, 50 Gm., 100 c.c.—Each ampule contains dextrose, U.S.P. (New and Non-official Remedies, 1930, p. 245), 50 Gm.; distilled water to make 100 c.c.; accompanied by an ampule containing 4 c.c. of a buffer solution. Eli Lilly & Co., Indianapolis.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

MINOR SURGERY AND BANDAGING. Gwynne Williams, M.S., F.R.C.S., Surgeon, University College Hospital. Twentieth Edition. 445 pages. Illus. Flexible binding, $3.50. Philadelphia: F. A. Davis Company, 1930.

HANDBOOK OF ANATOMY. James K. Young, M.D., F.A.C.S., Late Professor of Orthopedics, Graduate School of Medicine, University of Pennsylvania. Revised by George W. Miller, M.D., F.A.C.S., Associate in Anatomy, Jefferson Medical College. Seventh Revised Edition. 460 pages. Illus. Flexible binding, $3.75. Philadelphia: F. A. Davis Company, 1930.

EPISCOPAL HOSPITAL REPORTS. Volume VI. Edited by John H. Arnett, M.D., of Episcopal Hospital, Philadelphia. 460 pages. Illus. Cloth. Philadelphia: Press of Wm. J. Dornan, 1930.

TEXTBOOK OF PATHOLOGY. Edited by E. T. Bell, M.D., Professor of Pathology, University of Minnesota. 627 pages. Illus. Cloth, $8.00. Philadelphia: Lea & Febiger, 1930.

ARTERIAL HYPERTENSION. Edward J. Stieglitz, M.S., M.D., Assistant Clinical Professor of Medicine, Rush Medical College, University of Chicago. 280 pages. Illus. Cloth, $5.50. New York: Paul B. Hoeber, Inc., 1930.

OBSTETRICS. A text-book for the use of students and practitioners. J. Whitridge Williams, Professor of Obstetrics, Johns Hopkins University, Obstetrician-in-chief to the Johns Hopkins Hospital, Baltimore. Sixth edition, revised. 1157 pages. Illus. Cloth, $10.00. New York: D. Appleton & Company, 1930.

SELECTED READINGS IN THE HISTORY OF PHYSIOLOGY. Edited by John Farquhar Fulton, M.D., Sterling Professor of Physiology, Yale University School of Medicine, Baltimore, Md.: Charles C. Thomas, Publisher, 1930. Price $5.00.

A long need has been filled by Dr. Fulton's book. It is a type of book which seems to become more and more popular, judging from the success of works like E. R. Long's "Selected Readings in Pathology from Hippocrates to Virchow," and John Rurāh's "Pediatrics of the Past."

Dr. Fulton was fortunate in the choice of the arrangement, dividing the entire material into several large chapters according to subjects and arranging each chapter chronologically. Each chapter has a short but good introduction and every chosen part is preceded by a short biography of the author. The language is exquisite and the short but concise biographies are unsurpassed, describing in a few lines not only dry facts as to the life of the respective scientist but giving in brief an idea as to his main works and their effect on the progress of physiological thought. On every page the editor shows himself a scholar; he is most exact in giving the sources and—which increases the value of the book—is quite generous with reference as to authors and subjects. The translations and the use of technical terms are very good and Dr. Fulton can easily

take a chance on "holding himself responsible"; the same is true of the choice of illustrations and the print.

These "selected readings" are of much greater value than the average man is willing to admit before reading them. We have to realize that most of us have never seen the original texts of the most important findings in medicine, partly because they are in some language with which most of us are not acquainted, partly because the sources are rather difficult to secure, even in new editions. Here we have a selection of readings giving us the epoch-making findings in the progress of physiological knowledge, easy to read and arranged in a form to secure complete understanding.

Although one would like to see one or the other added selection in this book, especially in the chapters containing the physiology of the endocrine glands, it accomplishes its endeavors completely. This is not intended as any adverse criticism of this book—it is a sign of how one feels after reading it—one wants more.

ROBERT ROSENTHAL, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

POSITION WANTED: Young lady with two years' laboratory and *x*-ray experience wishes position in hospital, clinic or doctor's office. One year's experience in New York hospital. Also experienced stenographer. Address D-105, care MINNESOTA MEDICINE.

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WANTED—Position in or near Twin Cities. Graduate nurse, experienced in physiotherapy, hydrotherapy and massage. References. Address D-107, care MINNESOTA MEDICINE.

GOOD LOCATION—For medical doctor to share office with dentist. Address or call at 3754 Cedar Avenue, Minneapolis.

FOR SALE—Office and equipment. Excellent location at Lake and Hennepin, Minneapolis. Four room office suite well equipped. Leaving city. Good price for cash deal. Address D-109, care MINNESOTA MEDICINE.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association. Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

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SPINAL ANESTHESIA WITH REDUCED DOSAGE OF SPINOCAIN*

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Saint Paul

IT IS not our intention to discuss the value of spinal anesthesia, nor the advantages of spinocain (Pitkin) over other methods. Whoever has seen the perfect relaxation of the abdominal walls in a difficult operation in the upper abdomen readily recognizes the advantages of the method; but the fear of accidents has kept many surgeons from employing the method. The danger is, of course, proportionate to the dose of the anesthetic.

We simply want to mention, for the benefit of those who are using the method, a way of getting along quite well with considerably less spinocain than is generally given. The dose is hardly more than half of what we had to use formerly in order to obtain a satisfactory anesthesia. Spinocain is lighter than the cerebro-spinal fluid, and for this reason can, as it were, be floated to any position we desire, though the difference in specific weight of the spinocain (1.005) and of the cerebro-spinal fluid (1.007) is not great. Of course spinocain will diffuse rather rapidly and the novocain in it become fixed to the adjoining nerve tissue. For this reason it is desirable to bring it as rapidly as possible to the place where it is needed. The dorsal curve of the vertebral column, with the patient on his back, tends to bring the bulk into the lumbar arch. In order to reach the lower dorsal segments, the head of the table is raised. The anesthetic reaches the dorsal curve, and if the operation is to extend to the epigastrium the fifth or sixth root has to be reached. The ramus perforans anterior of the sixth thoracic nerve takes care of the sensation of the area about the base of the ensiform process, while the seventh supplies the region to the side of the ensiform. We ought to reach therefore the fifth root with our anesthetic because of the law of overlapping in the sensory distribution. If you look at the curve of the vertebral column of an individual lying on his back, you can readily see that sufficient tilting to cause the spinocain to float to the fifth nerve, or even only to the sixth or seventh, will allow it to escape toward the cervical spine, where it is not wanted and may cause trouble.

If you turn the patient onto the stomach, the dorsal curve allows you by proper tilting to bring the anesthetic to the exact spot desired. The head is kept low and the spinocain can not reach the cervical region before a considerable part of it has been fixed and only a small balance of novocaine has diffused. Looking over the back of the patient, with some horizontal line on the wall of the room as guide, one can readily make out the highest point in the dorsal curve. This is the whole trick. The spinocain thus does not go higher than we want it. It can therefore be injected undiluted with spinal fluid, and for this reason it will ascend more promptly before it is diffused and part of it fixed by nerve tissue. It will reach the desired upper levels in more concentrated form and it will above all strike the sensory and not the motor roots first. It will strike them posteriorly where they are still fine separate fibres. If we are to operate on the right side of the abdomen, the patient, after the spinal injection, is turned toward the stomach with the right shoulder higher than the left. If one operates on the left side, the left shoulder is made the highest spot. The fibres of this side then get the most direct anesthetic effect. Leaving out of consideration the anesthesia of the cauda equina, where turning on the stomach is of no value, it is evident that with the patient lying on the back the sensory thoracic roots re-

*Read before the Ramsey County Medical Society, St. Paul, Sept. 29, 1930.

ceive the anesthetic only after a certain amount of diffusion has reached the lateral areas of the spinal canal. This occurs after the motor roots and the cord surface have fixed part of the anesthetic. It has often happened since we have adopted the method of turning the patient toward



Fig. 1. Showing dorsal curve. Its apex is readily found by watching the horizontal lines on wall.

the stomach that we could start the operation while the patient could still wiggle the feet, though the abdomen was relaxed. In other words the spinocain ascended promptly after injection. With very small doses the relaxation was not perhaps always as complete as with the old way of turning the patient promptly onto his back. We usually leave the patient in the properly measured elevated position for about four or five minutes after the injection before turning him over on his back on the level table. By this time most of the novocain ought to be fixed to the neighboring nerve tissue. If doses larger than one ampoule are given, the patient after four and a half minutes of elevated position is tilted with the head low for half a minute before turning him on his back in order to counteract any undesired ascending of spinocain along the upper dorsal curve. I am, however, not sure that this is of any particular value after this lapse of time.

Let us repeat that it is here not our aim to make an appeal for spinal anesthesia in general nor even for spinocain, though we consider it a very important addition to anesthesia. Before I saw the beauty of a good spinocain anesthesia I had refused to take the risks of spinal anesthesia with my patients. Even now we are not sold on the spinal method. Since about the first of the year we have turned the patients over on the stomach after injection. Of 382 operations performed since January 1, 1930, 125 were done under local anesthesia, while spinal anesthesia was used in only 95 cases. In two additional instances spinal anesthesia was attempted but could not be carried out. These were not injected. In one of these the spinal canal was apparently entered but no fluid came and we did not repeat the maneuver; in the second case blood came.

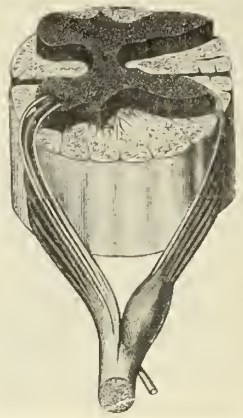


Fig. 2. Cross section of cord. Note the separate nerve fibres as they emerge from cord.

Among the ninety-five injections three were definite failures, probably due to too small a dose or to some faulty technic. The anesthesia was very insufficient. The other 92 anesthesias were considered satisfactory. Fourteen were marked as "reasonably good" on the chart and 76 as "excellent." In two cases I find no detailed notes. Among the cases judged as "reasonably good" there were instances of vomiting, or a return of sensation at the end of the operation. In four of these cases, to be mentioned later, the anesthesia had to be assisted by other means. It must be taken into consideration that at this time we were trying to find the smallest permissible doses. The site of preference for the injection in upper abdominal surgery is with us between the second and third lumbar vertebræ. Cerebro-spinal fluid is not withdrawn, especially if not more than one ampoule is given.

About four months ago the writer had acute appendicitis and the occasion was made use of in testing the method. My assistant, Dr. R. T. Muller, who performed about half of the anesthesias of the group of cases here presented (the other half having been done by the writer), injected 1.6 c.c. spinocain preceded by one and a half ampoules of ephedrin (Pitkin) subcutaneously. The usual preoperative morphine and atropine hypodermic was omitted. Apart from

the skin prick nothing was felt upon injection. I had to be told that the injection was completed. No paresthesia occurred. At times some patients had claimed they felt an itching at the start of the anesthesia. The operation was absolutely painless. At one time only, when some strong traction was made with a retractor, there was a gentle painless sensation of pulling downward on the skin in the region of the left nipple. The surgeons were emphatic in speaking of the complete relaxation of the abdominal muscles even when the peritoneum was lifted by forceps at the time of closure. About one hour after the injection sensation and motion started to return and were practically normal half an hour later. Painful spasms in the muscles of the back and abdomen on the right side had been present before operation and had somewhat blurred the issue. These persisted for several days after the operation. They re-appeared after operation with the restoration of nerve conduction and caused the patient to seek relief by getting up and sitting in an easy chair five hours after the injection. As the sitting posture relieved the spasms very much, several hours were thus spent in the chair reading a book. No untoward symptom followed the operation, no trace of nausea or headache, no afterpain except the normal moderate soreness in the wound.

In order to give a general picture of the nature of operations and the dose used we will group these 92 cases according to the dose of spinocain. The patients were all adults or at least 17 years of age.

The largest dose given was 3 c.c. This does not mean that it would not have been better to have given a little more in a very long operation, nor that some of the patients could not have gotten along quite well with less.

Cases	Spinocain
6	3 c.c.
7	2.75 c.c.
43	2 c.c.
36	less than 2 c.c.

Of these 36 cases receiving less than 2 c.c.

19 received	from 1.8 c.c. to 1.6 c.c.
14	1.5 c.c.
2	1.4 c.c.
1	1.33 c.c.

The six cases in which the maximal dose, i. e., *3 c.c. spinocain* was given, were the following:

One, a resection of the stomach with a large resection of the corpus pancreatis.

One, a very large hematoma retrocolicum the nature of which was unknown before operation.

One, gallstones with a cholecysto-duodenal fistula.

One, gallstones and appendicitis in a very large person.

One, gallstones and acute cholecystitis, also in a large person.

One, a gastro-jejunal ulcer.

The seven cases receiving 2.75 c.c. spinocain were:

3 cholecystectomies, two of them with acute cholecystitis, one with pericholecystitic abscesses.

2 cases of branched kidney stones.

1 a carcinoma (primary) of the Fallopian tube in a very large woman.

1 an acute perforation of a duodenal ulcer.

In 43 instances 2 c.c. spinocain (200 milligrams of novocain) were given:

1 an endothelioma of the pleura.

11 cholecystectomies (some with appendectomy).

1 a carcinoma of the pancreas; cholecystogastrostomy.

1 a carcinoma of the cecum; ileo-colic resection.

1 abdominal hysterectomy.

4 abdominal hysteromyomectomies.

6 appendectomies, acute or in interval; 3 of them with Watkins' operation for cystocele and perineoplasty.

4 abdominal hernias.

4 pelvic laparatomies, some combined with perineal work.

4 suprapubic prostatectomies.

5 Watkins' operation with perineoplasty (one with operation for bunions).

1 a post-anal dermal inclusion, acutely inflamed.

Less than 2 c.c. spinocain was administered to 36 patients. From 1.8 to 1.6 c.c. were given in the following 19 cases:

6 cholecystectomies (mostly with appendectomy).

3 diffuse peritonitis from appendicitis.

4 appendicitis.

1 carcinoma of ovary; large fixed mass, suture of ruptured sigmoid.

3 ovarian cysts.
1 carcinoma of leg after burn; excision and transplantation.
1 perineoplasty and hemorrhoidectomy.

1.5 c.c. spinocain was given in:

4 cholecystectomies.
1 gastrostomy.
2 double inguinal herniæ.
1 anus præternaturalis.
1 exploratory laparotomy in diffuse carcinomatosis of peritoneum.
1 cystoma ovarii malignum.
1 carcinoma of large myomatous uterus, grown into mesosalpinx (44 per cent hemoglobin).
1 appendectomy and perineoplasty.
1 cystoscopic dilatation of ureter in man.
1 curettage, perineoplasty and hemorrhoidectomy.

1.4 c.c. spinocain was given in:

1 carcinoma of rectum; excision. A little gas needed.
1 acute appendicitis gangrenosa. Excellent anesthesia.

1.33 c.c. spinocain was given in:

1 appendicitis subacuta. A little local anesthesia for the skin was added.

All the operations were done at St. Joseph's hospital except one of the cases of renal calculi, which was at the University hospital.

The patients to whom we gave more than one 2 c.c. ampoule almost all had lesions of the upper abdomen where a tedious operation was anticipated. Nevertheless you may have noticed that for instance among the 27 cholecystectomies there were 21 who had received at most 1 ampoule or even as little as 1.5 c.c. The case of endothelioma of the pleura received only 1 ampoule. In this instance the sixth, seventh, eighth ribs with the intervening structures of the chest wall had to be extensively resected and also a small area of the diaphragm where the tumor was adherent. The anesthesia was ideal. The ileo-colic resection was done with one ampoule and the anesthesia was all one could possibly wish. All pelvic work, herniæ among which were four very tedious postoperative abdominal herniæ with adherent intestines, appendicitis, acute or chronic, with or without free peritonitis, were never given more than 1 ampoule and very frequently less.

Similar cases were of course operated upon under general anesthesia, but if anything the more serious and tedious ones were chosen for spinal anesthesia.

With more experience the dose was gradually reduced. Among the last sixty cases of spinal anesthesia there were only four who received more than one ampoule (2 c.c.) of spinocain and among the last thirty-seven cases only eight had as much as 2 c.c. while the balance had often materially less.

In this list of ninety-two anesthesias which were classed as satisfactory there are, however, four instances where the spinal anesthesia alone was not sufficient. The first one of these was a resection of the stomach with a large resection of the middle portion of the pancreas. Three c.c. of spinocain were given. The operation took unduly long, lasting two hours and thirty-five minutes, and for the closing of the abdomen gas-ether was given. Up to that moment the anesthesia had been ideal. Another patient had received 1.7 c.c. for a cholecystectomy and appendectomy. When pulling on the cystic duct caused pain, gas was given for a few moments. The third case was an appendicitis where we tried the low dose of 1.33 c.c. Perhaps we started a little too soon with the operation; instead of waiting longer the skin was infiltrated with novocain. The fourth case was an excision of a carcinomatous rectum which was attempted with as little as 1.4 c.c. for trial. Less than half of the usual dose of gas was needed and no ether.

There were no untoward accidents, not even moments of apprehension in this group. Among the 95 patients operated upon under spinal anesthesia since January 1st, which includes the three unsatisfactory injections, there was one postoperative death—the carcinoma of the pancreas where a cholecysto-gastrostomy was done. It was not due to the anesthesia. The patient with his far advanced condition died a week after the operation in icterus gravis from terminal pneumonia. The number is of course far too small to give this statement any weight. But whatever the danger from spinal anesthesia may be it must be chalked up against spinal anesthesia in general, and not against the modification which consists of cutting this danger in half.

Before using our present modification we had a much larger percentage of instances where gas had to be added for a satisfactory anesthesia. This was undoubtedly mostly due to inexperi-

ence, but the doses over 3.25 c.c. spinocain caused at times apprehension which made the innovation of turning the patients over and thereby reducing the required dose by nearly one-half not only welcome to us but to several of our colleagues at St. Joseph's hospital who are emphatic in their statement as to the benefit they derived from this modification. Doctors W. C. Carroll, E. M. Jones, F. E. B. Foley, W. C. Rutherford, F. C. Schuldt, F. H. Neher, E. H. Norris and others have thus expressed themselves. Dr. Carroll started to use our modification soon after we did. He was emphatic as to the reduction in the dose of spinocain made possible by this method.

Dr. Foley uses our modification routinely at the Ancker (municipal) hospital in his urological service. He declares he has not had a failure since he adopted the procedure. The usual dose given was 2 c.c.

Dr. W. C. Rutherford states that by this manner of turning the patients over he can bring the anesthesia high enough for upper abdominal work without the apprehension he experienced previously, and that instead of giving 3 c.c. spinocain he can get along with 1.5 to 2 c.c.

Dr. Norris was converted to our procedure by an experience in a case of left sided inguinal hernia. Two c.c. of spinocain were injected while the patient rested on his left side. There was some delay in turning the patient on his back and he remained for five or six minutes on his left side. When he was finally placed on his back it was found that he had obtained perfect anesthesia on the right side of the abdomen, but almost none on the left. It was necessary to wait nearly fifteen minutes before the anesthesia appeared on the left side.

To sum up: We avoid mixing the spinal fluid with the spinocain by repeated withdrawals. We try to bring the undiluted spinocain as quickly as possible to the dorsal roots of the desired area. By this modification in the use of spinocain the dose can be reduced materially, the sensory roots getting the anesthetic directly in the least diluted form; the height of the anesthesia can be accurately arranged for, and the entrance into the cervical region (when it is not desired) is excluded, if we leave out of consideration a small amount of diffused novocain after most of it has been absorbed and fixed in the area where it was first brought to.

It would of course be very improper to try to raise this procedure to the dignity of a "method" and thus to somewhat lose sight of the real work done by Dr. Pitkin.

THE PRACTICAL VALUE OF EXAMINATION OF BLOOD SMEARS*

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EXCEPT for an occasional differential count, examination of the blood smear has to a very large extent been discarded by most men in general practice. Although determination of values for hemoglobin and erythrocytes gives much information, still it is only through examination of the smears that information as to whether or not the bone marrow is active, and, if it is active, the extent of this activity, can be obtained. In primary types of anemia the percentage of reticulated erythrocytes has been used as an index of the response to treatment. In the renewed interest in secondary anemia which has arisen in the last five years, comparatively little attention has been paid to these features of activity of the bone marrow. The technic of examination of smears is relatively simple. Special training is not required, except for recognition of rare types of leukemia or of conditions in which immature cells are just beginning to appear in the circulation and are present only in small numbers. The physician in general practice can carry out every necessary procedure for the diagnosis of diseases of the blood, since this requires only the equipment which should be in every physician's laboratory.

In order properly to interpret the smears, it is necessary that the technical procedure be given consideration. One of the most important features is the correct making of blood smears. Satisfactory smears may be obtained by the following method:

Preparation of slides:

1. Place in glacial acetic acid for fifteen minutes.
2. Wash in distilled water.
3. Place in 95 per cent ethyl alcohol for five minutes.
4. Dry with clean towel.
5. Pass through flame of alcohol or Bunsen burner two or three times.

Making the blood smear:

1. Hold slide by edges and touch against drop of blood so that two or three small drops lie across one end of slide.
2. Place this slide on a flat surface.
3. Take another slide; place it on middle of lower slide at angle of 30°. Draw slide backward into blood and then push forward, distributing the blood evenly. Do not exert pressure; the weight of the slide is sufficient. To make a thick smear use a rapid motion; to make a thin smear use slow motion.
4. Whip slide rapidly through the air until dry.

Wright's stain is most widely used in this country. The greatest difficulty attendant on its use is to obtain satisfactory distilled water, since if the water is too acid or is alkaline, improper staining of both erythrocytes and leukocytes results. However, since the introduction of buffer solution[2, 3] this difficulty has been eliminated and staining with Wright's stain has become a simple procedure; buffer solution maintains a hydrogen-ion concentration which is little affected by the addition of small quantities of acid or alkali. The solution recommended is made up as follows: 6.63 gm. of acid potassium phosphate (KH_2PO_4) and 3.2 gm. of dibasic sodium phosphate ($Na_2HPO_4.2H_2O$). These amounts are dissolved in 1,000 c.c. of the distilled water that is to be used.

Wright's stain is prepared by grinding 0.3 gm. of the dry stain in 100 c.c. of acetone-free absolute methyl alcohol. There are several satisfactory brands of the stain, already in solution, on the market. The technic of staining may be summarized as follows: Place 25 to 30 drops of Wright's stain on the blood film and allow it to stand one minute. Add an equal number of drops of buffer solution and allow the mixture to remain four minutes. Wash with distilled water and dry between blotting paper. If this technic is followed, an

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excellently stained slide is almost invariably obtained. It is unnecessary to change the time of staining with various lots of stain.

One of the most accurate indexes for determining the activity of the bone marrow is estimation of the percentage of reticulated erythrocytes. Reticulation is the result of a chemical reaction between a vital stain and the undifferentiated spongioplasm of the erythrocyte. Brilliant cresyl blue is the vital stain which is most commonly used in demonstrating this reaction. There are many methods in use, but the following has been found satisfactory for routine work. A small drop of freshly drawn blood is placed on the end of a clean slide. To this is added a small drop of saturated aqueous solution of brilliant cresyl blue, and the two are then thoroughly mixed with a clean glass rod. A smear is then made in the same manner as that employed in making the ordinary blood smear, and this is counterstained with Wright's stain. The number of reticulated cells in 1,000 erythrocytes is then determined and the percentage of reticulated erythrocytes present is calculated. Since reduction of the size of the field facilitates counting, we use a metal disk with a small aperture. Normally the percentage is between 0.5 and 1.5 per cent. Increase in the proportion of reticulated erythrocytes indicates hyperactivity of the bone marrow whereas decrease indicates lack of proper activity. The reticulated erythrocyte count is of particular value in determining the efficacy of treatment in severe cases of pernicious anemia. On adequate treatment, the response of reticulated erythrocytes reaches a maximum between the eighth and twelfth days, and by the thirtieth day it usually has returned to normal.

Before considering the more significant morphologic features of the cellular elements in primary and secondary diseases of the blood, a word should be said regarding the degenerative and regenerative signs as seen in the erythrocytes. Of the features of degeneration, the following are the most important: (1) hypochromasia, in which decrease in the hemoglobin in the erythrocyte, results in a uniformly pale cell, and (2) poikilocytosis in which erythrocytes are irregularly shaped; pear-like shapes and club-like shapes are most common. The most important signs of normal or physiologic regeneration are (1) reticulation of erythrocytes which has been described; (2) polychromatophilia in which the erythrocytes still retain sufficient basophilic spongioplasm to give a bluish or greenish tint to the cytoplasm when the cells have been stained with

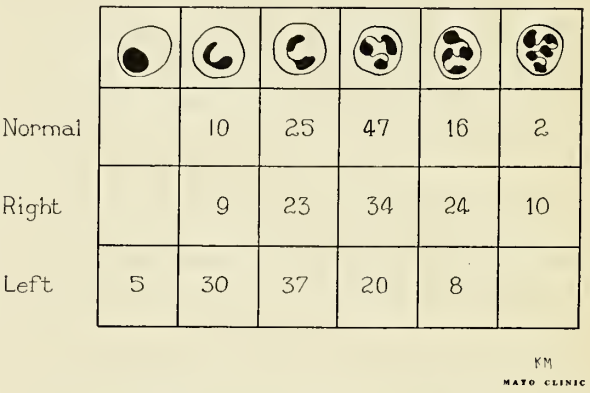


Fig. 1. Lobation of nucleus of the neutrophil with percentage of cells found in the normal, in a left shift and in a right shift.

Wright's stain; (3) anisocytosis in which there is variation in the size of cells, particularly of macrocytes and normocytes; (4) the presence of normoblasts, which are nucleated erythrocytes of varying degrees of immaturity, and (5) the presence, in some cells, of a single Howell-Jolly body, which is a pinkish-staining, rounded body, representing a remnant of the parachromatin of the nucleus after the chromatin has been dissolved in or extruded from the cell. The more important signs of pathologic regeneration are (1) basophilic stippling, which is due to precipitation of the basophilic spongioplasm by a circulating toxin; (2) the presence of megaloblasts, which are immature, nucleated cells of the primitive generation of erythrocytes; (3) the presence of multiple nuclear buds, which are evidences of beginning karyorrhexis in the nucleated erythrocyte, and (4) multiple Howell-Jolly bodies.

In addition to a study of the structural changes of the erythrocytes, morphologic study of the leukocytes is of great importance, particularly in regard to lobation of the nucleus of the neutrophilic leukocyte. Other morphologic changes in the leukocytes, such as those produced by toxicity, cannot be considered in a paper of this scope. In recent years, the terms "Schilling count," or "right

shift" and "left shift," have received considerable mention in the literature. This is best shown in Figure 1, which illustrates the distribution of the cells according to the number of lobes in the nuclei of the neutrophilic leukocytes. One distribution is that found in the blood of a normal person. Another distribution is that found in the blood of a patient who had a condition which occasioned a shift to the left; that is, an increase in the proportion of neutrophilic leukocytes of which the nuclei had a small number of lobes. The third distribution illustrated is that found in the blood of a patient who had a condition which occasioned the opposite picture, or a shift to the right. The shift to the left is seen in many conditions, particularly in infections, and is regarded as an indication of immaturity of the cell, or of the effect of a toxin on the chromatin in the nucleus. The degree of change from the normal is used as a diagnostic as well as prognostic sign.

In the study of secondary types of anemia, two important procedures are essential. One is elimination of the presence of organic disease, particularly of obscure organic disease. One condition which should be emphasized is chronic loss of blood from the gastro-intestinal tract. As has been pointed out by Giffin and Watkins, this has been associated with carcinoma of the stomach, duodenal ulcer, malignant growths of the small bowel, inflammatory lesions and benign ulcer of the small bowel, benign ulcer of the cecum, and polyps of the colon. In addition to elimination of organic disease, a clinical classification of chronic secondary anemia is essential. The types of anemia secondary to known organic disease or hemorrhage obviously are not considered. Giffin and Watkins have suggested a clinical classification of obscure types of secondary anemia. The types they recognize are those due to chronic hemorrhage, obscure malignant growths, chronic infection, dietary and other deficiencies and, in addition, a type in which the anemia at present must be regarded as indeterminate or idiopathic.

We have followed the morphologic classification of Watkins. The great majority of cases of idiopathic secondary anemia fall into two groups. In the first group, there is a proportionate reduction in the value for hemoglobin and the number of erythrocytes, giving a color index of approximately one. Morphologically, for the most part the erythrocytes are well filled with hemoglobin. If the reticulated erythrocytes are increased in number, and polychromatophilia and anisocytosis of macrocytes and normocytes predominate, the bone marrow is hyperactive and the anemia is probably due to chronic loss of blood or destruction of blood. If, on the other hand, there is predominance of degenerative features, such as poikilocytosis, anisocytosis evident by the presence of normocytes and microcytes, lack of regenerative activity, and low proportion of reticulated erythrocytes, it is obvious that there is hypofunction of the bone marrow. Treatment of the latter type of anemia should be directed toward stimulation of the bone marrow. In the second group there is reduction in hemoglobin and normal or nearly normal erythrocytes, giving a low color index. The percentage of reticulated erythrocytes is normal or slightly increased. Morphologically the outstanding feature is the hypochromasia of the erythrocytes, the cells having a pale, washed-out appearance. There may also be slight polychromatophilia and anisocytosis of the regenerative type. The leukocytes, as a rule, appear normal. In this type of anemia production of cells appears to be normal; the dysfunction is in the synthesis of hemoglobin. Whether or not the type of treatment can be determined by examination of the smears is yet to be shown. However, it seems reasonable that one should endeavor to supply the elements considered necessary in the synthesis of hemoglobin.

Although most cases of pernicious anemia may be diagnosed clinically, morphologic study of the blood is of great value, for in our experience certain features, when present, are diagnostic. The erythrocytes give evidence of generalized macrocytosis. The individual cells stain more deeply than normal, due to increased thickness of the cell and not to increased hemoglobin per unit of cell, as has been suggested by many authors. Other features, which may or may not be present, are polychromatophilia, anisocytosis, nucleated erythrocytes (both normoblasts and megaloblasts), basophilic stippling, and Howell-Jolly bodies. One of the most characteristic fea-

tures of the blood picture is found in the neutrophil. There is increase in the number of lobes of the nucleus, associated with thinning and stranding of the individual lobes. With macrocytosis and definite increase in lobation of the nucleus of the neutrophil, together with thinning and stranding of the individual lobes, there can be but little doubt that one is dealing with pernicious anemia. These changes do not necessarily hold for all stages of the disease, since there may be few signs, when the blood is nearly normal, or when the patient is under treatment.

In direct contrast to the picture seen in pernicious anemia is that of hemolytic jaundice. Here there is generalized microcytosis, with many of the cells spherical. The spherical microcytes are recognized by the absence of the pale center such as is seen in the normal, biconcave erythrocyte. In addition to these features, there is almost always marked regenerative activity, as is seen by increase in the proportion of reticulated erythrocytes, as well as by the other signs of physiologic regeneration, and especially by the presence of occasional large oval macrocytes. Naturally, the amount of regenerative activity noted is dependent on the stage of the disease and the degree of anemia. From recent observations it seems possible that there may be a form of hemolytic anemia in which the features just named may not be present.

There are three conditions in which study of the blood is the most valuable single diagnostic aid: (1) aplastic anemia, (2) leukemia, and (3) infectious mononucleosis. Persistently low percentages of reticulated erythrocytes or their absence, lack of other signs of regeneration of erythrocytes, and leukopenia with a high proportion of lymphocytes, are practically characteristic of aplastic anemia. Repeated examinations of the smears should be made before arriving at any definite conclusion.

The morphologic characteristics of the cells in acute and in chronic leukemia may be considered together. The outstanding features are varying degrees of immaturity of the leukocytes. Depending on the degree of immaturity, as well as on the proportion of immature cells to mature cells, the forms of leukemia may be classified into two types. In the acute type, the myeloblast or stem cell predominates; in chronic types, the mature cells are in the majority, but a small proportion of immature cells is present, some of which may be stem cells. It must be emphasized that not all cases of leukemia are associated with an increased number of leukocytes. Normal counts or leukopenia may be observed in association with acute types of leukemia, particularly in the acute types of leukemia of childhood. In a few cases in which there is leukopenia at the onset of the disease leukocytosis develops later.

Infectious mononucleosis is known under a variety of other names, such as acute benign lymphadenosis, benign lymphocytosis, or glandular fever. Since, clinically, this disease simulates leukemia in many respects, study of the smears is of particular importance. The characteristic feature of the blood is the maturity of the lymphocytes. Many of the atypical forms vary in size, form of nucleus, and staining reaction. Leukocytoid forms are frequently seen. One outstanding feature of the nuclei of these cells is the gradual transition between the chromatin and parachromatin which is so characteristic of the mature lymphocyte. As mentioned before, study of the smears over a period of some time is necessary to establish the diagnosis.

Purpura hemorrhagica may be confused with aplastic anemia and acute leukemia. Examination of the blood smear from a patient with purpura hemorrhagica distinguishes this condition from acute leukemia by the absence of immature leukocytes. The presence of reticulated erythrocytes and other regenerative signs characteristic of activity of bone marrow distinguish it from aplastic anemia. A normal differential count is the rule, rather than leukopenia and the high proportion of lymphocytes seen in aplastic anemia.

Agranulocytic angina is another condition in which a morphologic study of the blood smear, although not diagnostic, is of value. By daily examination of the smears there is found progressive decrease in the proportion of neutrophilic leukocytes. In those cases which end fatally, there is generally decrease in the number of lymphocytes toward the termination of the illness.

SUMMARY

The most important morphologic features of the blood in secondary anemia, and the more common forms of blood dyscrasia have been briefly considered. Morphologic examination of the blood should not be used as an absolute diagnostic criterion, but should be regarded as a valuable diagnostic and clinical aid.

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COAGULATION CONDITIONS AND BACTERIAL EFFICIENCY OF PRELIMINARY WATER TREATMENT

The United States Public Health Service has recently announced the results of certain experimental studies relating to coagulation conditions and bacterial efficiency of preliminary water treatment. The studies recorded in this report are concerned with the effects of (a) the period of sedimentation, (b) the method of applying coagulant to the raw water, (c) the hydrogen ion concentration of the coagluation reaction, and (d) the density of coagulant added to the raw water, on the bacterial efficiency of coagulation-sedimentation as a preparatory treatment of water for rapid sand filtration and, incidentally, on the efficiency of the entire process of rapid sand filtration.

The experiments were carried out during portions of the three years, 1926, 1927, and 1928, at a fully equipped experimental rapid sand water filtration plant of 160,000 gallons daily capacity, designed to typify, as nearly as possible, current large-scale practice in this process of water purification, but with certain additional features incorporated in the plant for experimental purposes.

The results of the study yielded the following main conclusions:

(1) Substantial gains in the bacterial efficiency of coagulation-sedimentation resulted from prolongation of the nominal sedimentation period up to 8 or 9 hours, and measurable gains with periods up to 12 hours.

(2) Variations in the hydrogen ion concentration in the coagulation reaction from 5.6 to 6.9 produced little effect on the efficiency of coagulation-sedimentation. The efficiency became sharply diminished, however, with hydrogen ion concentration values exceeding 7.0 and slightly improved with hydrogen ion concentration values approaching 5.5.

(3) The bacterial efficiency of double-stage coagulation, with two separate stages of sedimentation, was consistently greater than that of single-stage coagulation with one stage of sedimentation. The observations indicated, however, that with the same total amount of coagulant and the same total period of sedimentation, little if any difference was observable between the results shown by double-stage and single-stage coagulation when carried out in conjunction with two separate states of sedimentation.

(4) A fairly consistent relation was shown between the amounts of coagulant added to the raw water and the resulting bacterial efficiency, both of coagulation-sedimentation and of this state in conjunction with filtration. This relationship was found to hold irrespective of raw-water turbidity or bacterial content, though it was more apparent when the turbidity and bacterial numbers were higher. Measurable gains in efficiency were shown with increases in coagulant density ranging up to 5 grains per gallon.

The general conclusion reached from the foregoing series of experiments was that the bacterial efficiency of rapid sand filtration processes can be increased very materially by means of longer periods of sedimentation and larger amounts of coagulant than ordinarily are used in current water purification practice. The economical limit of sedimentation appears to be reached somewhere between 8 and 12 hours, with little gain in efficiency beyond the upper limit of time stated.

FURTHER OBSERVATIONS ON THE TREATMENT OF PERNICIOUS ANEMIA WITH GASTRIC TISSUE OF SWINE*

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In November, 1929, I presented at the meeting of the Minnesota Society of Internal Medicine the results of feeding gastric tissue of swine to patients who had pernicious anemia.[1] In all cases there was increase in the numbers of reticulocytes, followed by increase in the number of mature erythrocytes and in the values for hemoglobin. The number of leukocytes also was increased in most instances.

Feeding of gastric tissue was suggested by the work of Castle and Loche, who gave muscle meat to a normal subject and, after they had caused the subject to vomit, they gave the vomitus to patients who had pernicious anemia. They thus brought about improvement in blood and symptoms, such as occurs after treatment with liver. My demonstration that approximately 26 per cent of a large series of blood relatives of patients who had pernicious anemia lacked free hydrochloric acid in the gastric content served further to fix attention on the stomach as a possible etiologic factor in the disease. Also, the well known fact that practically all patients who have pernicious anemia lack free hydrochloric acid in the gastric content suggested that the stomach was in some way connected with the etiology of the disease, and that the feeding of gastric tissue might supply some unknown element lacking in the stomachs of patients who have the disease. While my method of administration and preparation of the material was being perfected and any possible harmful effects of feeding the raw material were being investigated, Sturgis and Isaacs, and Sharp reported the results of independent work with desiccated stomach. Since then Wilkinson has reported work also done independently with raw and dried gastric tissue.

My results with raw and dried stomach were in all respects similar to those reported by Sturgis and Isaacs, and by Sharp, so that I was able to corroborate their work at an early date. Wilkinson's work with raw and dried gastric tissue gave results of a similar nature. In six cases which I reported[2] in November, 1929, the results were similar to those obtained by feeding liver or its extract. Because of the unfavorable age of the patients treated and because when most of the patients started treatment the number of erythrocytes was relatively high, the average increase was not quite so high as is found in the average patient treated with liver or its extract. The average increase in number of erythrocytes in the group of six patients was approximately 1,000,000 in an average of twenty-seven days. The number of reticulocytes, generally accepted as a criterion of regeneration of erythrocytes, increased in one instance to 35.6 per cent of the total number of erythrocytes, and the highest percentage of reticulocytes obtained in the individual cases reached an average of 11.7 per cent.

My conclusion, at that time, was that the material had an effect on the blood and the symptoms of patients who had pernicious anemia similar to that of liver or its extract. Since that time I have carefully observed thirty-five other patients in the hospital and have fed various preparations of raw and dried gastric tissue. My results with these additional cases amply corroborate the view expressed in the earlier paper, that the effect is similar to that obtained with liver or its extract, and this was also the view of Sturgis and Isaacs, of Sharp, and of Wilkinson.

Among patients whose erythrocytes numbered less than 2,000,000 in each cubic millimeter of blood (Table 1) when treatment was instituted, the number increased from an average of 1,450,000 to an average of 2,920,000 in twenty-three and fifty-eight hundredths days, or 432,000 each week. Among those who started treatment when the number of erythrocytes was more than 2,000,000 in each cubic millimeter of blood (Table 2) the number increased from an average of 2,710,000 to 3,570,000 in twenty-two and ninety-four hundredths days, or 292,000 each week.

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Duluth, July 14 to 16, 1930.

Table 1

PROGRESS OF PATIENTS WHOSE ERYTHROCYTES NUMBERED LESS THAN 2,000,000 IN EACH CUBIC MILLIMETER OF BLOOD AT BEGINNING OF TREATMENT

Case	Days in hospital	Beginning of treatment		End of treatment	
		Hemoglobin, per cent (Dare)	Erythrocytes in each cubic millimeter of blood, millions	Hemoglobin, per cent (Dare)	Erythrocytes in each cubic millimeter of blood, millions
1	27	15	0.75	55	2.78
2	29	20	0.93	58	2.81
3	27	38	1.62	58	3.32
4	34	34	1.37	65	3.78
5	27	45	1.97	75	3.80
6	27	18	1.07	55	2.77
7	24	40	1.95	60	3.29
8	20	42	1.96	68	3.36
9	21	30	1.32	68	3.06
10	21	40	1.88	70	2.98
11	35	30	1.42	50	2.73
12	25	35	1.50	70	3.14
13	27	20	1.04	44	1.86
14	33	38	1.66	68	3.84
15	21	28	1.31	68	3.25
16	25	28	1.21	40	1.62
17	22	40	1.59	75	3.08
18	15	32	1.86	38	2.67
19	21	8.05 gm.	1.63	65	3.37
20	30	35	1.53	58	3.23
21	11	20	1.13	48	2.07
22	13	35	1.53	45	2.09
23	22	26	1.19	50	3.16
24	9	38	1.42	40	2.07
Average	23.58	31.6	1.45	57.9	2.92

Table 2

PROGRESS OF PATIENTS WHOSE ERYTHROCYTES NUMBERED BETWEEN 2,000,000 AND 4,000,000 IN EACH CUBIC MILLIMETER OF BLOOD AT BEGINNING OF TREATMENT

Case	Days in hospital	Beginning of treatment		End of treatment	
		Hemoglobin, per cent (Dare)	Erythrocytes in each cubic millimeter of blood, millions	Hemoglobin, per cent (Dare)	Erythrocytes in each cubic millimeter of blood, millions
25	21	48	2.30	72	3.00
26	45	60	2.67	70	3.95
27	26	48	2.20	65	3.37
28	30	48	2.01	75	3.45
29	33	50	2.25	68	3.37
30	34	43	2.14	60	3.56
31	21	50	2.20	75	3.38
32	14	65	2.79	70	4.28
33	16	8.8 gm.	2.40	75	3.28
34	13	55	2.41	75	3.36
35	20	60	2.55	73	3.57
36	41	75	3.57	83	4.20
37	18	70	3.62	80	4.20
38	10	70	3.49	70	3.21
39	32	58	3.14	70	3.69
40	5	75	3.34	80	3.73
41	11	73	3.00	75	3.22
Average	22.94	59.3	2.71	72.7	3.57

The number of reticulocytes increased in all cases, reaching a maximum of 65.8 per cent in one case.

There has been the same improvement in general symptoms that was reported in the earlier paper. The neurologic symptoms responded well in some instances but not in all. The minor neurologic symptoms usually have improved or disappeared, but in the more advanced cases the patients have been less responsive to treatment.

In most instances the stools were examined for parasites before and after treatment to avoid overlooking possible transmission to the patient of a parasitic disease by the use of the raw material. Disease has not been transmitted in any known instance.

As a result of the treatment of these additional cases I feel safe in asserting that the results with feeding of gastric tissue are similar to and apparently equal to those obtained with liver or its extract. Presentation of detailed study of these cases would be voluminous and must be reserved for another contribution.

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TREND OF MENINGOCOCCUS MENINGITIS IN THE UNITED STATES

At a recent conference of State and Territorial Health Officers with the Public Health Service, it was pointed out by representatives of the Service that reports received from State Health Officers for the past five years indicate that there has been a progressive increase in the number of cases of meningococcus meningitis that have been recorded. It is true that the actual number of cases are not large when compared with the total population. It is significant, however, that each year there has been an increase over the preceding year, and that this rise has been continuing for five years.

When the prevalence of meningococcus meningitis increased during the period of 1915 to 1917, the number of cases rose in Europe before the movement occurred in the United States, but after the World War the number of cases did not rise noticeably in Europe until 1929, and then the increase was not general and the rates were not high.

Incomplete reports for the first three months of 1930 show rates higher than the normal for England and Wales, Scotland, The Netherlands, and Poland, but no figures from Europe have been found indicating a general increase in the prevalence of this disease comparable with that in the United States.

There was an outbreak of meningococcus meningitis early this year in the Anglo-Egyptian Sudan, and reports from the French Protectorate of Morocco show some increase in cases in March. Recent reports from Asia do not show anything unusual in the prevalence of the disease. Canada has reported comparatively few cases, but there has been a slight increase in incidence in Mexico.

The nomenclature relative to meningococcus meningitis has been changed several times, the disease having been variously designated cerebrospinal meningitis, epidemic meningitis, and other similar terms. For this reason earlier figures are not exactly comparable with the later ones.

The total number of cases of meningococcus meningitis reported throughout the United States for the past five years is as follows:

Year	Cases
1925	1,859
1926	2,226
1927	3,204
1928	5,781
1929	9,660

In considering these figures the difficulties of obtaining accurate reports should be borne in mind.

Since March, 1930, the reported prevalence of meningococcus meningitis in the United States has been lower than it was in the corresponding months of 1929.

THE INTRAVENOUS ADMINISTRATION OF SODIUM ISO-AMYL-ETHYL BARBITURATE (SODIUM AMYTAL) FOR THE ALLEVIATION OF PAIN DURING LABOR

A REPORT OF FORTY-SIX CASES

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MANY drugs have been used for the alleviation of pain during labor. All of them have failed in a greater or lesser degree to fulfil the requirements of an ideal anelgesic and anesthetic, namely, that pain shall be abolished or greatly alleviated; that the course of labor shall not be interfered with or prolonged; that the mother shall not be harmed; that the baby shall not be harmed.

The pharmacologic actions of the barbituric acid derivatives in animals and in man have given promise that one or more of them might be of value in obstetrics, and several reports have been made of their use. Cleisz[1] reported favorably on the intravenous administration of somnifene (diethyl-allyl-iso-propyl barbiturate of diethylamine) during labor. Delmas and Roume[2] reported unfavorably on their experience with the same drug. More recently Robbins et al.[3] reported on the administration of sodium amytal (sodium iso-amyl-ethyl barbiturate) in one hundred cases of labor, mostly by the intravenous route. Drabkin et al.[4] reported the use of the same drug administered rectally in thirty-three obstetrical patients.

The intravenous route of administration of sodium amytal was chosen in this series of cases. It is less painful than intramuscular administration. The patient obtains immediate relief from labor pains. The variable factor of intestinal absorption is eliminated. Furthermore, the effect of the drug is noted instantly and, Weiss[5] having pointed out that there are marked individual variations in the response of patients to identical doses, a suitable dose can be more accurately determined during administration.

The use of drugs other than sodium amytal was avoided in this series. Exceptions to the rule are noted in the tables. Toward the end of the second stage, however, small doses of pituitrin were occasionally given and 1 c.c. of pituitrin was given intramuscularly at the beginning of the third stage followed by 1 c.c. of ergot intramuscularly as soon as the placenta had been delivered.

The drug was supplied† in pyrex ampules containing either 0.5 or 1.0 gm. (7½ or 15 gr.). Immediately before administration, it was mixed with sterile distilled water from an accompanying ampule to make a ten per cent solution, which was clear in one to three minutes. It was advised that solutions not clearing in five minutes and having an opalescent appearance indicating the presence of colloidal material be discarded. All solutions used in this series, however, cleared promptly.

When a patient was in active labor and rectal examination revealed 3 cm. dilatation of the cervix, she was told that she would be given relief from pain at any time that she desired. The solution was then injected intravenously at the rate of 1 c.c. (0.1 gm. or 1½ gr.) per minute in doses of .250 gm. (3¾ gr.) to .666 gm. (10 gr.), the patient usually being asleep by the time 3 or 4 c.c. had been administered. A first dose of 0.5 gm. (7½ gr.) was found to be most effective for a woman weighing about 68 Kg. (150 lbs.).

When signs of returning consciousness, such as complaint of increasing pain or rational responses to questions, were noted, a second and even a third dose of the drug varying from .333 gm. (5 gr.) to .500 gm. (7½ gr.) was administered. The drug was also repeated for increasing restlessness, without, however, any lasting quieting effect being observed. The average interval between doses, when the drug was repeated once or twice during the labor, was two and one-third hours. The longest interval was seven hours, and the shortest, one-half hour. The average interval from the time of the first administration of the drug to delivery was four

*From the Earl Clinic, St. Paul, Minn.

†I am indebted to Eli Lilly and Company for supplying the drug used in this study.

hours in thirty-two primiparæ and two hours in fourteen multiparæ. The longest interval was ten hours, and the shortest, fifteen minutes.

A total dosage as high as 1.233 gm. (18½ gr.) was given during one labor. A subsequent determination of dosage in relation to body weight in twenty-four cases showed that .003 gm. (1/20 gr.) to .007 gm. (1/9 gr.) per Kg. in one dose produced varying degrees of analgesia and amnesia; and that .007 gm. (1/9 gr.) to .009 gm. (1/7 gr.) per Kg. in one dose produced complete amnesia for two to three hours.

Amnesia in twenty-six (70.3 per cent) of the thirty-seven cases which received 7½ gr. or more was classified as complete from the time of administration until immediately after delivery. Most of the patients then regained consciousness, although several of them had amnesia lasting one or two hours after delivery. Eight patients (21.6 per cent) were classified as having partial amnesia. Two of these patients (case 16, table 1 and case 33, table 2) had complete amnesia lasting for three hours after administration, when they regained consciousness and the drug was not repeated. Three others (cases 39, 40 and 45, table 2) had complete amnesia for one and three-fourths to two and one-half hours before delivery. One patient (case 38, table 2), a nervous primpara who received 7 and 6 gr. six and one-fourth and four hours before delivery, and in whom good amnesia was noted, afterwards stated that the labor had been very painful. Three patients (8.1 per cent) had slight amnesia. Patients who appeared to be conscious were questioned as to pain and were asked to remember numbers. The day following delivery they were asked to recall the numbers and were questioned concerning events of the labor, usually with little or no remembrance of what occurred after administration of the drug. Some of them remembered such incidents as being moved from bed to a wheel cart or to the delivery table. All patients, including those who had partial amnesia, were disoriented as to time. Most of the patients, including all of the multiparæ, were enthusiastic about the relief obtained.

The character of contractions during the first stage was not noticeably affected by the drug except in one case in which the administration of 5 gr. to a patient who had been in labor ten hours, immediately stopped contractions, which were resumed two hours later, the patient then delivering in one hour (case 3, table 1). In several patients, voluntary efforts during second stage contractions were not noted, but these cases terminated spontaneously without apparent delay. In five patients (cases 16, 18, 24, 25 and 29) to whom the drug was administered late in the second stage, termination of labor seemed to be hastened. The average duration of labor in thirty-two primiparæ was fifteen hours, in fourteen multiparæ, nine and one-fourth hours.

Eleven patients (24 per cent) of the entire series were extremely restless soon after administration of the drug and it was necessary to restrain them during contractions. One patient became maniacal and walked about the room in spite of forcible attempts to restrain her. Six patients (13 per cent) were moderately restless, and six (13 per cent) were slightly restless. Restlessness was usually present only during contractions or when the patient was disturbed. It was the most objectionable result of the procedure, for the patients who were restless required constant watching by nurses and were difficult to control during examinations and preparation for delivery, although they were quickly quieted by small amounts of an inhalation anesthetic after being taken to the delivery room. No relationship could be determined between the degree of restlessness and the depth of amnesia, the most restless patients having no memory of the labor or of their actions.

In all but six cases of the entire series, an inhalation anesthetic was administered at the time of delivery or toward the end of the second stage (see tables). It was noted that smaller amounts of the anesthetic were required than usual, and that the restlessness was readily controlled. The six patients who received no supplementary anesthetic were quiet during delivery, and some of them had episiotomies performed or lacerations sutured without remembering either the delivery or the perineal operation.

In seventeen cases in which the mothers' blood pressure was recorded before and after administration, nine cases (52.9 per cent) showed an average increase of 12 mm. of Hg., the greatest increase being 26 mm. and the least 2 mm.; five cases (29.4 per cent) showed an average decrease of 11 mm., the greatest decrease being 26 mm. and the least 2 mm.; and three cases (17.7 per cent) showed no change. In eighteen cases in which the pulse was recorded immediately be-

TABLE 1.—DATA ON TWENTY-TWO PATIENTS IN NORMAL LABOR TO WHOM SODIUM AMYTAL WAS ADMINISTERED INTRAVENOUSLY AT ANCKER HOSPITAL, SAINT PAUL

CASE NO.	AGE	PARITY	DURATION LABOR (HR.)	INTERVAL DRUG TO DELIVERY (HR.)	DOSAGE (GR.)	RESTLESSNESS	AMNESIA	POSITION	METHOD OF DELIVERY	ANESTHESIA	DIFFICULTY IN RESUSCITATION	RESULT FOR MOTHER	RESULT FOR BABY
1	18	I	11	2½	3¾	Slight	Partial	OLA	Spont.	CHCL3	None	Fair	Excellent
2	22	I	17½	4½	3¾	None	Partial	OLA	Spont.	CHCL3	None	Good	Excellent
3	32	VI	13	3	5	None	Partial	ODA	Spont.	CHCL3	None	*Poor	Excellent
4	19	I	14	3	6	Slight	Partial	OLA	Spont.	CHCL3	Slight	Good	Good
5	18	I	15½	4½	6	None	Complete	ODA	Spont.	CHCL3	None	Excellent	Excellent
6	26	I	14	1½	6	Extreme	Complete	ODA	Spont.	CHCL3	None	Fair	Excellent
7	29	I	21	3	6	None	Partial	OLA	Spont.	CHCL3	None	Good	Excellent
8	22	I	12	3	6	None	Complete	OLA	Spont.	None	None	Excellent	Excellent
9	20	II	17	¾	6	Moderate	Complete	OLA	Spont.	None	None	Good	Excellent
10	23	I	15	1½	7½	Moderate	Complete	OLP	Forceps	CHCL3	None	Excellent	Excellent
11	19	II	10	2	7½	None	Complete	OLA	Spont.	CHCL3	Moderate	Excellent	Fair
12	20	I	9½	3½	7½	Slight	Complete	OLA	Spont.	CHCL3	None	Excellent	Excellent
13	19	I	8	2	7½	None	Complete	ODP	Spont.	CHCL3	Slight	Excellent	Good
14	24	IV	4	2	7½	None	Complete	OLA	Spont.	CHCL3	Slight	Excellent	Good
15	24	II	11½	4½	7½	None	Complete	OLA	Spont.	CHCL3	None	Excellent	Excellent
16	18	I	6¼	4¼	7½	Slight	**Partial	OLA	Spont.	CHCL3	None	Good	Excellent
17	24	I	18	2	7½	None	Partial	OLA	Spont.	CHCL3	None	Fair	Excellent
18	21	I	19	2¼	7½	None	Complete	OLA	Spont.	CHCL3	None	Excellent	Excellent
19	29	I	14	2½	7½	None	Complete	OLA	Forceps	CHCL3	Moderate	Excellent	Fair
20	19	I	19	10	†15	Moderate	Complete	OLA	Spont.	None	Slight	Excellent	Good
21	22	I	11	7	†15	Extreme	Complete	ODP	Spont.	None	Slight	Fair	Good
22	30	I	20	6	‡15	Slight	Complete	OLA	Spont.	None	None	Excellent	Excellent

* Contractions stopped for two hours.

** Amnesia complete for the first three hours. Labor induced with castor oil and quinine.

† Two doses of 7½ gr. each, 10 and 3 hours before delivery in case No. 20, and 7 and 4¾ hours before delivery in case No. 21. Morphine sulphate gr. 1/6 and scopolamine gr. 1/200 with the first dose.

‡ Three doses of 8, 3½ and 3½ gr. administered 6, 3½ and 1½ hours before delivery.

TABLE 2.—DATA ON TWENTY-FOUR PATIENTS IN NORMAL LABOR TO WHOM SODIUM AMYTAL WAS ADMINISTERED INTRAVENOUSLY AT MIDWAY HOSPITAL, SAINT PAUL

CASE NO.	AGE	PARITY	DURATION LABOR (HR.)	WEIGHT (LB.)	TOTAL DOSAGE (GR.)	FIRST DOSE (GR.)	INTERVAL TO DELIVERY (HR.)	SECOND DOSE (GR.)	INTERVAL TO DELIVERY (HR.)	RESTLESSNESS	AMNESIA	POSITION	METHOD OF DELIVERY	ANESTHESIA	DIFFICULTY IN RESUSCITATION	RESULT FOR MOTHER	RESULT FOR BABY
23	36	III	4½	141	7½	7½	2½	0	0	Extreme	Complete	SLA	Extract.	CHCL3	None	Excellent	Excellent
24	39	III	6	170	7½	7½	¼	0	0	Moderate	Slight	OLA	Spont.	CHCL3	Slight	Poor	Good
25	30	II	19	169	7½	7½	½	0	0	Extreme	Slight	OLA	Spont.	CHCL3	None	Poor	Excellent
26	26	I	7	132	7½	7½	1½	0	0	None	Complete	OLA	Spont.	CHCL3	None	Excellent	Excellent
27	26	I	43	145	7½	7½	5	0	0	None	Complete	ODP	Spont.	CHCL3	None	Excellent	Excellent
28	26	I	11¼	156	7½	7½	4	0	0	None	Complete	OLA	Spont.	CHCL3	None	Excellent	Excellent
29	42	III	3	167	7½	7½	½	0	0	None	Complete	OLA	Spont.	CHCL3	Slight	Excellent	Good
O30	30	II	3	135	7½	7½	1	0	0	None	Complete	OLA	Spont.	CHCL3	None	Excellent	Excellent
O31	38	IV	3½	192	*7½	7½	1	0	0	None	Partial	OLA	Spont.	N2O	None	Good	Excellent
32	29	III	20	155	7½	7½	4	0	0	None	Complete	ODA	Forceps	CHCL3	None	Excellent	Excellent
33	18	I	16	133	9½	9½	5¼	0	0	Moderate	**Partial	ODP	Spont.	CHCL3	None	Good	Excellent
O34	23	I	22¾	150	10	10	4½	0	0	None	Complete	OLA	Spont.	N2O	None	Excellent	Excellent
35	33	IV	8¾	175	10	10	3¼	0	0	None	Complete	ODA	Spont.	CHCL3	None	Excellent	Excellent
36	20	I	12	141	12	7	2½	5	1	Extreme	Slight	ODP	Spont.	CHCL3	Moderate	Poor	Fair
37	28	I	10½	123	12½	7½	2½	5	2	Extreme	Complete	OLA	Spont.	CHCL3	None	Good	Excellent
O38	23	I	11¾	144	13	7	6¼	6	4	Extreme	Partial	ODP	Spont.	N2O	Extreme	Poor	†Poor
O39	26	I	11	187	13½	7½	5	6	1¾	None	††Partial	ODP	Spont.	N2O	None	Good	Excellent
O40	26	I	16½	179	15	7½	6¾	7½	2½	Extreme	††Partial	OLA	Spont.	N2O	Moderate	Fair	Fair
41	27	I	18¾	144	15	7½	3½	7½	2½	None	Complete	OLA	Forceps	N2O	Extreme	Excellent	Poor
42	30	I	10½	169	15	7½	8	7½	6¼	Moderate	Complete	ODP	Spont.	CHCL3	Slight	Excellent	Good
43	40	III	6¼	131	17	7	5	‡5	2¾	Extreme	Complete	ODA	Spont.	None	None	Good	Excellent
44	22	I	12½	157	17½	10	4¼	7½	2¼	Extreme	Complete	OLA	Forceps	Ether	Moderate	Good	‡‡Fair
O45	28	I	29½	138	18½	7½	7½	‡5	5	Slight	††Partial	OLA	Forceps	N2O	None	Good	Excellent
46	24	I	7½	135	17½	10	2¾	7½	2	Extreme	Complete	OLA	Spont.	CHCL3	None	Good	Excellent

* Morphine sulphate gr. 1/6 1¼ hours before delivery.

** Amnesia complete for the first 3 hours.

† Baby was 3 weeks premature, weighing 5 lbs. 10 oz., and delivered ODP persistent. Morphine sulphate gr. ¼ 3½ hours before delivery.

†† Amnesia complete after the second dose in cases No. 39 and 40, and after third dose in case No. 45.

‡ A third dose of 5 gr. was given 1½ hours before delivery in case No. 43, and a third dose of 6 gr., 3 hours before delivery, in case No. 45.

‡‡ Mother had a severe pre-eclamptic toxemia.

fore, and at intervals after administration and until delivery, ten cases (55.5 per cent) showed an average increase of 12 beats per minute, the greatest increase being 28 and the least 5; three cases (16.7 per cent) showed an average decrease of 8, the greatest decrease being 10 and the least 4; and five cases (27.8 per cent) showed no change. In ten cases in which the respirations were recorded before and after administration, three cases showed an average increase of 7 per minute, varying from 4 to 12; two cases showed a decrease of 4 and 6; and five cases showed no change. The changes in blood pressure, pulse and respiration were, obviously, those common to normal labor. There was no suggestion of the decreased blood pressure, the moderately increased pulse, and the reduced rate of respiration constantly observed by Weiss[5] in patients with acute poisoning due to barbituric acid derivatives.

Postpartum observation disclosed no increase in bleeding, no restlessness after delivery, no increase in the incidence of nausea and vomiting. The patients were drowsy for several hours after delivery. Upon regaining consciousness, they did not complain of fatigue, although the striking well-being of patients following the administration of scopolamine-morphine analgesia was not observed.

The effects of the drug on the mothers in the thirty-seven patients who received 0.5 gm. (7½ gr.) or more of sodium amytal were summarized and evaluated, taking in consideration the following factors: (1) completeness of amnesia; (2) degree of restlessness; (3) interference with the progress of labor. In twenty-one cases (56.8 per cent), the results in the mother were classified as excellent; in nine cases (24.3 per cent), the results were good; in three cases (8.1 per cent), fair; in four cases (10.8 per cent), poor.

In nineteen cases in which the fetal heart tones were observed before and after administration of sodium amytal, eleven cases (57.9 per cent) showed an average increase of 12 beats per minute at some time before delivery, the greatest increase being 22, and the least 4; three cases (15.8 per cent) showed an average decrease of 17 beats per minute, the greatest decrease being 22, the least 10; and five cases (26.3 per cent) showed no change. These changes were considered to be well within normal limits.

Resuscitation of the babies was necessary in fifteen out of the forty-six cases (32.6 per cent). Of these, eight babies (17.4 per cent) were only slightly apneic and breathed after clearing the air-passages and rubbing the back; five (10.9 per cent) were moderately apneic and were given alpha-lobeline intramuscularly, after which breathing quickly became established. The apnea seemed to be due to an increased sluggishness of the respiratory center, for when breathing had once been established following stimulation, most of the babies cried lustily. Two babies (4.3 per cent) were asphyxiated and, in addition to drug stimulation, required tubbing before they breathed. One of the asphyxiated babies (case 38, table 2) was a premature infant who delivered O D P persistent; the other was delivered by a moderately difficult mid-forceps operation (case 41, table 2).

The average loss of weight after birth in the twenty-four cases recorded in table 2 was 6.8 ounces. Three babies who delivered spontaneously and weighed from 8 pounds 9 ounces to 9 pounds 7 ounces at birth, each lost 13 ounces. The average time during which weight loss occurred in the twenty-four cases was 3.4 days. All babies were given complementary feedings until and unless the mother's milk supply was adequate. Fifty per cent of them had regained their birth weight when discharged from the hospital on the ninth to the twelfth days. No relationship could be established between difficulty in resuscitation and weight change. No babies were sleepy and unable to nurse for several days after delivery as noted by Delmas and Roume[2] with their use of somnifene.

SUMMARY

The slow intravenous administration of freshly prepared, clear, ten per cent solutions of sodium amytal in doses of .500 gm. (7½ gr.) to .666 gm. (10 gr.) to thirty-seven women of a series of forty-six, after labor had become well established, produced analgesia and amnesia for periods of two to three hours. When the drug was repeated in doses of .333 gm. (5 gr.) to .500 gm. (7½ gr.) at average intervals of two and one-third hours until delivery, satisfactory amnesia was produced in all but 8.1 per cent. One-fourth of the patients were somewhat restless as a result of the medication, and one-fourth of them were extremely restless until quieted by small amounts of an inhalation anesthetic given before and during delivery. In the whole series,

there was no apparent slowing of labor except in one case, and in several cases labor seemed to be hastened. Changes in maternal blood pressure, pulse and respiration were those of normal labor. Third stage and postpartum complications were not increased. Fetal heart rates were not abnormally altered, but one-third of the babies were more or less apneic and required stimulation to establish respiration. Postnatal infant behavior and weight curves were not altered from the normal.

CONCLUSIONS

1. When the dosage and intervals are individualized, the intravenous administration of sodium amytal during the latter half of the first stage and during the second stage of normal labor induces satisfactory amnesia in nine out of ten cases.
2. Labor is rarely, if ever, prolonged by its use and may sometimes be hastened.
3. There is no evidence of harm to the mothers.
4. Slight to extreme restlessness results from its administration in one-half of the patients and is an objectionable feature of the procedure.
5. Restlessness can be controlled toward the end of the second stage and delivery facilitated by the use of an inhalation anesthetic, of which lesser amounts than usual need be administered.
6. One-third of the babies are somewhat apneic at birth, apparently due to a torpidity of the respiratory center induced by the drug, and require stimulation to establish respiration.
7. No other deleterious effects of the drug are observed in the postnatal behavior or weight changes of the babies.

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MORE MISBRANDED NOSTRUMS

The following products have been the subject of prosccution by the Food, Drug and Insecticide Administration of the United States Department of Agriculture which enforces the Federal Food and Drugs Act: Palatol (Parke, Davis and Company of New York City), consisting essentially of cod liver oil, malt, wild cherry, phosphates, cholesterol, alcohol, sugar and water. Halanum (The Radium Research Foundation), containing no radium and being in fact essentially a weak solution of common salt in water. Eleven Bros. Tonic (Eleven Bros. Laboratories, Inc.), consisting essentially of epsom salt, iron chloride, alcohol and water, flavored with peppermint. Phenyo-Caffein (The Phenyo-Caffein Company), consisting essentially of acetanilide, caffeine and camphor. Fenholloway Sulphur Springs Water (A. E. Jackson), containing a filthy animal and vegetable substance. Bel-Caps (W. E. Shuit), containing ammonium, iron and calcium compounds, sulphates, carbonates, chlorides, bromides, camphor, aloin, small amounts of alkaloids and plant extractives, including a laxative drug. EfeDron Hart Nasal Jelly (The Hart Drug Corporation), consisting essentially of a mucilaginous mass containing ephedrine hydrochloride, chloretone, carbolic acid, salt and water flavored with oil of cinnamon. Crane's Laxative Quinine Cold Tablets (The Crane Medicine Company), each tablet containing 8/10 grain of acetanilide with quinine and cinchonine salts and a laxative plant drug. Bromoline (The Senoret Chemical Company) consisting of coated tablets containing acetanilide, cinchonine sulphate and resinous plant material. Grip-Sules (Kingsbury and Frick), capsules containing about 1½ grains of acetanilide, about ⅓ grain of caffeine, a quinine compound and a pungent drug, such as red pepper. Numoss (The C. R. Products Company), consisting of ammonium chloride, creosote and Irish moss, flavored with oil of anise. Hogan's Old Reliable Cough Syrup (Hogan's Old Reliable Cough Drops, Inc.), consisting essentially of ammonium chloride, red pepper, chloroform, extracts of plant drugs, including licorice, squill, wild cherry and senega, with alcohol, sugar and water, and flavored with oil of anise. (Jour. A. M. A., September 27, 1930, p. 951.)

THE USE OF SODIUM AMYLETHYL BARBITURATE IN NERVOUS DISORDERS*

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IN the treatment of the various types of psychoneuroses, and also in the more profound psychotic conditions, aside from the need of a thorough understanding of the individual personality make-up, a careful analysis of the existing conflicting emotional elements, and a study of his social conditions, there is, in many instances, a real need for medicinal therapy. The relief of daytime tensional states, such as extreme degrees of depression, excitability or anxiety, the alleviation of various painful stimuli, and the production of a sufficient amount of restful relaxation and sleep at night, without too great a depressive action the next morning, all contribute a real share toward relieving the psychoneurotic or psychotic case by preventing the exhaustion which accompanies emotional tension, inhibiting the reception of painful psychic stimuli, and improving the general physical tone of the body through obtaining a proper amount of rest.

In prescribing drugs for the relief of nervousness, the alleviation of pain or the production of sleep, there is great need for the careful study of the effect of the drug, its adaptability to the purpose for which it is intended, and a most careful individualization of dosage. That a given drug may affect different individuals in various manners and degrees is probably more true with psychiatric patients as a whole than with any other type of patients with whom we may come in contact. The literature sent out by various pharmaceutical and chemical houses which are producing an almost innumerable number of products, unfortunately labelled a trade name rather than the proper pharmacological term, must not be taken for granted. If we are to use these products, we must study them carefully, and determine for ourselves by actual clinical experience when they may be of benefit to a patient, the proper dosage in each instance, and the recognition of cases where their use is contraindicated. To illustrate the variability of action and the possible misuse of these drugs, let us consider three of the most commonly used products, namely, luminal, veronal and the various bromide salts. I have frequently encountered patients who have been prescribed luminal a grain and a half three times a day, whose condition required certainly not more than a half grain three times a day. On the smaller dose they made much more rapid improvement and were able to cooperate much better with the other phases of treatment. I have seen patients who have been prescribed veronal as a sedative during the day and luminal to produce sleep. Other cases have been prescribed allonal as a daytime sedative and bromides as an hypnotic. To me, these are examples of poorly adapted medication. In my experience, I have found luminal to be a much better sedative than a soporific, though if given in large enough doses, it will produce sleep, but will also be more depressing the next morning than many other drugs that might have been given in a smaller dose. I have found veronal too depressing to be used as a daytime sedative, yet a fairly efficient soporific, but requiring careful adjustment of dosage in order to avoid severe depressing reaction the following morning. I have found allonal a good analgesic, a poor sedative and a rather undependable hypnotic unless given in a dosage that almost certainly produces a depressed feeling upon awakening. I consider bromide salts useful as sedatives, of no value as analgesics and unsatisfactory as hypnotics unless given in large doses. I do not use bromides except over very short periods, on account of the tendency to produce gastric irritation and skin eruption.

Practically all these drugs, unless properly prescribed, have the possibility of harmful results. The literature contains numerous references to the production of a toxic rash from the use of luminal. Some cases will develop a rash from a very small dose, others only on

*Presented at the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1930.

large doses or prolonged usage. I have personally known a case that presented a rather typical picture of lethargic encephalitis, and was so diagnosed by three different physicians, that proved to be chronic luminal poisoning and cleared up on withdrawal of the drug. Veronal, if taken in large doses over a sufficient length of time, is extremely depressing, is altogether too readily obtained at drug stores, and frequently used by nervous psychotic individuals to permanently escape from their worldly cares and troubles. Toxic psychoses produced by overly large doses of bromides are not at all uncommon, and often deprive the individual of usefulness and adaptability to everyday life for a period of many months. I have in mind a patient who entered the hospital for an operation for a chronic ailment, who was very nervous in anticipation of the operation. By way of preparation, to settle her nerves, she was given sixty grains of bromides for four doses at quite frequent intervals over a two-day period. At the end of this time she was greatly excited, hallucinated and delusional. It was almost four months before she returned to her normal state.

From the foregoing, it would seem apparent that there is an opportunity for improvement on our present medicinal therapy of nervous states. There is a need for further judicious experimentation and careful clinical observation. The realization of this led me to investigate the possible adaptation of sodium amylethyl barbiturate. The successful use of this drug in the field of surgery in producing narcosis sufficiently deep to allow major surgical operations to be performed without any serious after-effects, indicated that it might well be a most useful agent in the field of psychiatry. A search of the literature has failed to reveal the experience of others who may have been using the drug with the same objective, although there are several articles dealing with its use in surgery.

This drug is the sodium salt of iso-amylethyl barbituric acid. It has been used rather extensively for several years as a general anesthetic in experimental pharmacological and physiological work. More recently, it has been prepared so that when protected against moisture and carbon dioxide, a stable compound, suitable for intravenous use, is obtained. It may be used intravenously, intramuscularly, orally or rectally. When prepared for intravenous use, it should be a five or ten per cent weight volume solution. The solution is affected by exposure to air, therefore it should be used within a short time after preparation, especially if given intravenously. If the solution is not perfectly clear after a four or five minute standing, it should not be used. The dose when used intravenously for controlling convulsive states such as are found in epilepsy, alcohol poisoning, meningitis and other convulsive states of a like nature, is from four to twelve grains. If repeated at frequent intervals, subsequent doses should be smaller, as it has been found to have a certain cumulative action, especially if given intravenously. However, this has not been my experience when the drug is given orally. When it is administered intravenously, close observation to determine the first signs of loss of consciousness affords valuable information regarding the additional amount which will be required to obtain the desired effect. Most patients who lose consciousness after the administration of three or four grains do not require as much additional amount of the drug as those who require five to seven grains before losing consciousness. Shortly after starting the injection of the drug, the patient gets drowsy and soon falls into a very deep sleep. Respirations are decreased in amplitude and there is a slight degree of cyanosis sometimes present. Respiration may become very difficult, cyanosis extreme, blood pressure fall dangerously low and the pulse become thready if the injection is given too rapidly or in too large a dose. The injection should not be more rapid than one cubic centimeter per minute. I have not personally experienced this reaction in any of my patients, due to giving the drug too rapidly. However, in one of my cases, a hospital interne administered the drug and the patient's respiration, blood pressure and pulse rate became alarming, though he rapidly regained a normal state following a short period of artificial respiration and cardiac stimulation.

This drug should not be given intravenously nor in large doses, otherwise, in cases suffering from generalized arteriosclerosis, hypertension or any pulmonary disease. It should also be given cautiously following large doses

of morphine or to patients who are sensitive to morphine and drugs of a similar nature. Patients who are known to be hypersensitive to other barbituric acid derivatives should not be given this drug. It has been my observation that its intravenous administration in the group of cases with which we are dealing, is indicated only in convulsive states and in cases where the patient's coöperation is not sufficient to allow the administration of the drug orally.

In the oral administration of the drug, it is best given in capsule form, as it has a bitter taste and is not well taken in powder form. In most cases where oral administration is possible, from six to twelve grains of the drug are usually sufficient to obtain sleep over a period of from five to ten hours. This is a smaller dose range than has been recommended for oral administration in surgical use. However, in the non-surgical case, the desired narcosis need not be so deep, therefore the dosage may be smaller. There is another point of difference between the non-surgical patient and the surgical patient. It has been observed that where this drug is given, followed by other anesthesia and operation, there is a considerable period of excitement upon the patient's awakening, followed by a further period of lethargy. This has not been my experience in giving it to non-surgical patients. This would indicate that the period of excitement and prolonged lethargic condition was not due to the drug itself, but due to a combination of factors such as the addition of other anesthetic agencies, surgical shock or other physiological reaction. Where oral or intravenous administration is not possible, the drug may be administered intramuscularly or rectally. I have had no experience with rectal administration of this drug. However, I have obtained very satisfactory results with intramuscular injections. When given intramuscularly, only a small amount, three or four cubic centimeters, should be injected at any one point, otherwise the point of injection will be quite painful and unnecessary tissue reaction result. When injected intramuscularly in small amounts, after a period of two or three days, there is no evidence of any tissue reaction nor is the area painful.

I have used this drug in the various types of cases that one encounters in the usual psychiatric practice. I have used it, to a large extent, for its sleep producing action. However, I have attempted to determine whether or not, in smaller doses, it might be valuable as a sedative. It is a most excellent drug in controlling convulsions when given intravenously. I have also used it in four cases of idiopathic epilepsy. These cases have been observed over a period of from three to four months. The average dose has been one and one-half to three grains two or three times a day. These cases were all previously on luminal therapy. In two cases there was no perceptible change in the frequency or severity of the convulsions. In one case the convulsions were more severe and more frequent than when on luminal therapy, and in one case the patient reported longer intervals between convulsions and some improvement in his general feeling of well-being. However, these cases have not been observed over a sufficient length of time to draw definite conclusions as to its value in epilepsy. As a daytime sedative in psychoneurotic cases, it has been my observation that the drug, unless given in very small doses, has too great a soporific action, and if given in small doses its action is very transient.

As a soporific in psychoneurotic cases, and also in psychotic cases attended by marked excitement and depression with severe insomnia, when given in carefully adjusted doses, it is a real aid in obtaining sufficient restful sleep with a minimum degree of depressant action.

THE PROBLEM OF DISEASE OF THE PARANASAL SINUSES*

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DISEASE of the sinuses is as old as man and has been dealt with continuously throughout the ages, as examination of skulls of ancient civilizations reveals. The generally prevalent pessimistic idea at this time that disease of the sinuses is not amenable to well directed treatment is not based on facts but usually has been spread by word of mouth. It is, I believe, true that we are now emerging from an era in which an overenthusiastic profession chose to assign disease of the sinuses to many symptoms referable to the head in particular, and to the body in general. For this reason, perhaps, many destructive intranasal and extranasal operations were performed without affording relief of symptoms, but more often resulting in adding new symptoms to the old. If operation was not performed, the patient would be occupied by home-treatment measures, and thus had many reasons to be introspective and pessimistic. Fortunately, the physiologic and pathologic causes of symptoms are better understood now and a much more rational, scientific and conservative era is in sight.

For better orientation, it might be useful to recall that the paranasal sinuses are a part of the upper respiratory tract, and, although their function is not well defined, they still are present and occasionally become diseased. The tract has a definite function in respiration performed by virtue of the highly specialized nearly automatically controlled mucous membrane. The function involves warming, moistening, and cleaning the air breathed. It is obvious that under certain environmental or climatic conditions the response would be variable. The environmental reaction will not be considered here. The maxillary, frontal, and sphenoid sinuses develop after birth and in certain instances, for unexplained reasons, do not develop symmetrically in pairs. The ethmoid sinuses are usually present at birth.

All sinuses communicate with the nose by small openings in the lateral wall underneath the middle turbinate except the posterior ethmoid and sphenoid sinuses, which empty into the postnasal space. The lining membrane is continuous with and similar to that of the interior of the nose except that it is thinner, and it has fewer glands and fewer blood spaces. It is easy to explain, then, why the sinuses may be involved in infections of the upper respiratory tract. Perhaps, if the nose and appendages were more often spoken of as the upper respiratory tract, their function, and the physiologic and pathologic phenomena relating to them would be better understood. Infections of the upper respiratory tract are so frequently encountered and usually so self-limiting that they are not often given serious consideration, although from an economic standpoint such infections are significant. Infections of the lower respiratory tract have always received serious consideration.

The direct etiologic factor in disease of the sinuses, as has been intimated, is the severe infection of the upper respiratory tract. The sinuses become involved by contiguity and continuity, and because of the inadequate size of the opening into the nose, resolution is protracted or does not occur until well directed interference is instituted. The maxillary sinus may become involved by contiguity to an infected tooth. The occurrence of such involvement has been variously estimated as between 12 and 25 per cent.

The use of various aqueous solutions in nasal irrigations and sprays has a time-honored precedent, but as early as 1844 it was pointed out that for physiologic and pathologic reasons, they were not without great danger. Such solutions denude the surface of the membrane of its greatest protective mechanism, and produce pathologic changes. The only excuse for their use is that irrigations have offered a convenient method of clearing the nasal passages.

The habit of blowing the nose may have much to do with causing infections of the sinuses by forcing infected material into the sinuses. Animals have infection of the sinuses as the result of infections of the upper respiratory tract but not as a result of blowing the nose.

Underlying the immediate etiologic factor, however, is the large general problem of hygiene, allergy, dietetics and preventive medicine. Each

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might well be the subject of discussion. I would suggest, however, that the frequency of "head colds" is not nearly so dependent on the particular anatomic arrangement or condition of the structures encountered in the upper respiratory tract, as is hygiene, including environment, mode of living, occupation, manner of dress and diet. It has been shown experimentally that animals may be made less resistant to infections of the upper respiratory tract by certain diets, and that by change of diet all symptoms can be made to disappear. It is seen, then, that the problem of disease of the sinuses is not entirely that of the rhinologist but begins with the guidance of the general profession.

The severity of the symptoms in acute sinusitis, so far as pain and discomfort are concerned, is due to the intense congestion of the membranes. Not until this congestion is relieved by the natural process of secretion will relief be afforded. To hasten the onset of secretion is the aim of treatment at this stage. The most effective means has been found to be general measures, such as rest in bed in semi-upright position, steam inhalations, hot moist packs over the face, saline catharsis, and coal-tar products by mouth. The severe symptoms usually last over a period of forty-eight hours, or the time usually necessary for the secretory mechanism to function properly. After this period shrinkage of the nasal membranes induced by topical applications of astringents followed by gentle suction will markedly relieve the symptoms, and will hasten resolution. Surgical measures at this stage are dangerous, for an avenue for extension of infection toward the meninges is opened. Most patients with acute sinus trouble will go on to an uneventful convalescence under this regimen.

If certain symptoms, such as localized pain, occurring usually in the morning hours and subsiding at midday, and copious purulent secretion continues to be troublesome after a period of a week or ten days, depending on the severity of these symptoms, one may decide to continue local treatment or to use certain conservative surgical measures. In case such treatment does not favorably affect the disease, it becomes chronic, and cases may be grouped as follows: (1) serous or, as commonly called, catarrhal, (2) purulent, (3) hyperplastic, or polypoid, and (4) a combination of these. The problem, then, rightly belongs to the rhinologist.

It may be said that the signs and symptoms of disease of the sinuses are usually quite definite and that there is little difficulty in making a diagnosis. Roentgen examination has become increasingly important as an adjunct diagnostic aid in disease of the sinuses. Whoever interprets the picture must be conversant with the anatomy, the anatomic variations and pathologic changes of the paranasal sinuses. The roentgenogram can be very misleading. Roentgenograms are usually more accurate in the diagnosis of conditions other than suppuration, such as tumors, foreign bodies, osteomas, and changes in bone. When roentgenograms are used in conjunction with other diagnostic aids, however, their aid is invaluable.

Again the diagnosis of disease of the sinuses may be quite difficult and the accurate site of the sinus or sinuses involved may require repeated eliminative examinations in the course of several days of observation. For instance, it might seem easy to say, in conjunction with definite physical changes in the middle meatus, that the ethmoid sinus is involved. When one remembers that the maxillary and frontal sinuses empty into the middle meatus and the presence of this pathologic secretion may cause visible physical changes of the membranes without involvement of the ethmoid sinus itself, it becomes necessary to decide definitely whether or not the ethmoid sinuses are involved. Many times, in my experience, counter-draining the maxillary sinus into the inferior meatus has caused the appearance of the middle meatus to change completely, and operation on the ethmoid sinus was thus avoided. It is difficult to understand how isolated ethmoid cells could become involved without signs, except in cases in which they are infected from an infected lacrimal sac. Patients frequently present themselves with the complaint that they have disease of the sinuses, either self-diagnosed or because of some symptom an acquaintance may have suggested was due to disease of the sinuses.

In general, it may be said that well directed intranasal operations will clear up disease of the sinuses in most cases, if serious pathologic changes have not occurred in the mucous membrane and bone. The principle of treatment involved is drainage and ventilation.

When profound pathologic changes have taken place in the mucous membrane and bone,

the radical external operations must be employed. In this instance, the principle of treatment involved is the removal of the disease.

In the past, the radical operations of the frontal sinus resulted in seriously deforming scars but at present this often can be avoided. From my own standpoint, the hyperplastic disease of the ethmoid is the most difficult to deal with satisfactorily.

The results in general are satisfactory. It must be admitted, however, that it is not always possible to effect a restitutio ad integrum status of the parts. This fact, perhaps, explains why certain patients have post-operative symptoms not due to disease but to altered physiologic reactions.

It should be pointed out that pain and headache caused by other intranasal disorders than disease of the sinuses, or eye strain, migraine, neuritis of the nasal ganglion, brain tumors, constipation, toxemia, and so forth, are not benefited by operations of the sinuses no matter how well performed. Vasomotor rhinitis, usually the manifestation of some general disturbance, or allergy, endocrine, or other causes, has been frequently treated as sinusitis, with obviously unsatisfactory results. Symptoms referable to the reaction of the mucous membrane to its environment, such as stuffiness under certain climatic conditions, dropping of mucus into the pharynx, or coughing, are not explained on a basis of disease of the sinuses.

The relation of disease of the sinuses to the focal infection theory of causation of disease is important. I believe that the sinuses too often have been considered important foci, even when there were no manifest signs of sinusitis. There has been a radical change of opinion within the last five years in regard to posterior ethmoid and sphenoid sinuses as the causative factor in retrobulbar neuritis. However, the sinuses may be the definite cause of focal infection. We all have had such cases. A recent review of 400 consecutive cases of frank chronic suppurative sinusitis gave a surprisingly low incidence of syndromes of focal infection. It seems obvious that frank sinusitis when present should be taken care of although it may not be the focus causing the trouble. If treatment for such conditions is to be rational and well directed, all foci of infection must be investigated.

SUMMARY

There is nothing mysterious or mystical about disease of the paranasal sinuses. The results of well directed treatment are satisfactory. There is no reason why the general prevalent idea that "once a sinus disease, always a sinus disease" should obtain. A better understanding of the function, physiology and treatment of the paranasal sinuses will overcome this attitude.

SYNTHETIC THYROXINE

The A. M. A. Chemical Laboratory recalls that Kendall isolated thyroxine from the thyroid gland and that he considered it to have a constitution which later was found to require revision and that in the U. S. Pharmacopeia thyroxine is defined as an active principle obtained from the thyroid gland. Attention is called to the fact that while spelled in the Pharmacopeia without a final "e" the substance is basic in character and must be spelled thyroxine. Three years ago, Harington and his co-workers arrived at the conclusion that the Kendall formula was not correct. Later this conclusion was confirmed by the preparation of thyroxine synthetically. Synthetic thyroxine has been prepared by pharmaceutic laboratories abroad and one brand, Synthetic Thyroxine-Roche, has been submitted to the Council on Pharmacy and Chemistry. The Laboratory found this brand to comply with the standards which it had elaborated and the Council admitted this product to New and Non-official Remedies for the reason that the pharmacopeial definition does not apply to the synthetic substance. (Jour. A. M. A., August 16, 1930, p. 484.)

PALSY OF THE CRANIAL NERVES*

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In an endeavor to evaluate the significance of palsy of the cranial nerves, a study was made of the record of 213 cases that were selected at random. In these cases, partial or complete palsy of the cranial nerves was referable to 474 cranial nerves. These are classified in tables 1 and 2. The problem naturally divided itself into the recognition of various degrees and types of such palsy, and as accurate an interpretation of them as possible. The clinical diagnoses were proved by necropsy in four cases only. Strong corroborative evidence was furnished by biopsy in twenty-five cases and by operation in thirteen cases. Clinical tests (chiefly serologic and roentgenographic) were supportive in eighteen cases. In all others, the pathologic and etiologic agents were suspected from evidence varying from an epithelioma plainly in view to the association of palsy with trauma or infection. That such evidence can be misinterpreted is exemplified by observations at necropsy in one case in which there had been palsy of a series of cranial nerves. This was thought to be due to extension of a tumor. It was found that the neoplasm had eroded a small hole through the skull, permitting infection to enter and cause the localized meningitis which was responsible for the palsy of the cranial nerves.

With the foregoing plan, each cranial nerve will be considered in a way suggestive of the natural clinical approach to problems of the nerve. Only the most fundamental facts concerning lesions of cranial nerves can be presented.

FIRST OR OLFACTORY NERVE

The first nerve consists of many fine nerve fibers entering the upper pole of the nasal cavity through the cribriform plate subserving the function of smell. From a partial lesion of the nerve the patient might not notice anything. From a complete lesion of this nerve the patient might or might not be aware of the absence of smell (anosmia). To elicit a complete lesion of this nerve the examiner uses volatile substances such as camphor, benzine and oil of wintergreen, and tests one nostril while the other is closed. The complete inability to smell these substances is far more significant than the failure properly to recognize them. If the sense of smell seems to be absent, the following possibilities must be eliminated before cranial nerve palsy can be considered: (1) nasal obstruction; (2) scars in the nose from disease or operation; (3) the presence of ozena, and (4) congenital absence of smell.

Conditions that may cause palsy of the cranial nerves are (1) brain tumor involving the basifrontal region; (2) endothelioma of the olfactory groove; (3) fracture of the base of the skull, and (4) meningitis.

SECOND OR OPTIC NERVE

The second nerve, the largest cranial nerve, enters the orbital cavity through the optic foramen and by means of the eye subserves the functions of vision for color and form. From a partial lesion of this nerve the patient might or might not be especially aware of defective vision although a very slight lesion of the maculopapillary bundle would express itself as defective visual acuity (amblyopia). A complete lesion of the nerve produces blindness (amaurosis). To elicit a partial lesion the ability to see very small colored objects at a given distance, to read various standardized print, to count fingers, to see moving objects, or to perceive light are tests which are employed. Various grades and types of defect of vision were presented by Lillie. In the case of amblyopia, or defect of vision, the following possibilities, among others, must be eliminated before a lesion of the optic nerve can be established: (1) refractive errors; (2) opacity of media of eye; (3) disease or destruction of macula, retina, or choroid; (4) glaucoma; (5) defect of intelligence; (6) disease of optic pathways back of optic chiasm; (7) congenital defect, such as color blindness; (8) defect of muscles necessary for binocular vision, and (9) hysteria.

Conditions that may cause palsy of the optic nerves are: (1) multiple sclerosis, in which the

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optic nerves are often affected; (2) retrobulbar neuritis, which sometimes proves later to be multiple sclerosis; (3) tumor of the basifrontal region, causing injury to the optic nerves; (4) pituitary tumor; (5) basilar meningitis (syphilitic, tuberculous or meningococcic); (6) secondary optic atrophy from choked disks from intracranial pressure, and (7) primary optic atrophy.

Table 1

PALSY OF THE CRANIAL NERVES CAUSED BY LESIONS OF 474 CRANIAL NERVES IN 213 PATIENTS

	Nerve																								
	1st		2nd		3rd		4th		5th		6th		7th		8th		9th and 10th		11th		12th		Total
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	
Partial			9	12	35	38	6	5	20	26	15	21	15	29	12	14	9	13	10	7	8	12	316
Complete	3	3	3	3	12	9	5	1	6	3	19	17	15	14	8	12	6	7	3	6	1	2	158
Total	3	3	12	15	47	47	11	6	26	29	34	38	30	43	20	26	15	20	13	13	9	14	47
Bilateral	3		8		16				3		9		5		3		4		2				53

Table 2

PALSY OF THE CRANIAL NERVES (PARTIAL OR COMPLETE): 213 PATIENTS

Lesion suspected*	Nerve												Total
	Patients	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth and tenth	Eleventh	Twelfth	
Tumors													
Primary	54	4	9	16	9	31	25	21	21	16	15	14	181
Secondary	12			4	1	6	2	4	2	6	2	4	31
Intracranial inflammation													
Unknown type	52		5	20	3	7	16	24	3	5	1	2	86
Syphilis of the central nervous system	17		6	17	1	1	3	3	2	2	2		37
Tuberculosis	10		2	10		1	6	3	1		1	1	25
Injury													
Fracture of the skull	10		2	1			5	9	7				24
Other types	24	2	2	9	2	4	1	5	1	1	5		32
Vascular lesions	15		1	9	1	5	7	2	3	3		1	32
Congenital defect or anomaly of development**	2			2				2					4
Miscellaneous	17			6			7		6	2		1	22

* Evidence supporting the diagnosis afforded by necropsy in four cases, biopsy in twenty-five, operation in thirteen and clinical tests (chiefly serologic and roentgenographic) in eighteen.
** These may or may not be due to lesion of the nerve.

THIRD OR OCULOMOTOR NERVE

The third nerve enters the orbital cavity through the superior orbital fissure and supplies the muscles to elevate the lids and to move the eyes upward, downward and toward the nose. The inferior oblique muscle moving the eye upward and outward is also supplied by it. In addition the pupillary constrictor and ciliary muscle for accommodation are supplied by fibers associated with it. Partial lesion would be likely to cause diplopia with the patient looking in various directions, and might cause ptosis of the eyelid and fixation of the pupil. With complete lesion the patient would notice complete ptosis, diplopia in looking up, down or to the nasal side, fixation of the pupils to light, and difficulty in reading without corrective glasses, due to failure to accommodate. The types of diplopia due to complete paralysis of the third nerve were presented by Fuchs.[1] The examiners would notice in the case of a complete lesion on elevating the ptosed lid the inability to rotate the eye upward, downward or nasalward, and fixation of the pupil to light and accommodation (Fig. 1). In cases of apparent partial or complete paralysis of

the third nerve the following conditions must be eliminated: (1) congenital ptosis (usually bilateral); (2) the apparent ptosis due to Horner's syndrome, the result of paralysis of the cervical sympathetic nerves; (3) disorders of the muscle of the eye (muscular dystrophy and atrophy) which simulate palsy of the cranial nerves; (4) asymmetric positions of the eyes; (5) disease of the nucleus of the nerve and (6) disease of the midbrain producing weakness of conjugate movements of the eye.

Palsy referable to the third cranial nerve seems to be most commonly caused by inflammation or injury at the base of the brain, such as that due to syphilis or to tuberculosis.

THE FOURTH OR TROCHLEAR NERVE

The fourth nerve enters the cranial cavity through the superior orbital fissure and supplies the superior oblique muscle which rotates the eye downward and inward. Partial paralysis of this nerve may produce diplopia. Complete paralysis would do little more. Patients with this lesion sometimes tilt their heads to compensate for the oblique diplopia. Paralysis of this nerve is not detectable by the examiner without special meth-

Table 3

CONDITIONS THAT MAY BE CONFUSED WITH PALSY OF THE CRANIAL NERVES

First Nerve	Fourth Nerve	Eighth Nerve
Nasal obstruction	Lesions of the other ocular motor nerves	Obstructive deafness
Operative scars in nose		Mental deficiency
Ozena	**Fifth Nerve**	Schilder's disease
Congenital absence of smell	Paresthesia as seen in psychosis	Disease of the midbrain
Second Nerve	Syringobulbia	Pineal tumor
Refractive errors	Lesions of the brain stem	**Ninth and Tenth Nerves**
Opacity of media of eye	Lesions of the upper cervical portion of the cord	Hoarseness from laryngitis
Disease of macula, retina or choroid	**Sixth Nerve**	Difficulty in swallowing from nasal or esophageal obstruction
Glaucoma	Defects of muscle	Medullar lesions
Mental deficiency	Ocular asymmetry	**Eleventh Nerve**
Disease of optic pathways	Disease of the brain stem	Arthritis of neck and shoulder
Congenital defects, color blindness and so forth	**Seventh Nerve**	Monoplegia
Defect of muscles necessary for binocular vision	Nuclear lesion	**Twelfth Nerve**
Hysteria	Lesion of cortical motor area	Nuclear lesion, as in bulbar palsy
Third Nerve	Asymmetry of the face	Pseudobulbar palsy
Congenital ptosis	Hemiatrophy of the face	Sore tongue
Horner's syndrome	Hemihypertrophy of the face	
Muscular dystrophy and atrophy	Edema of one side of the face	
Ocular asymmetry	Contracture of one side of the face	
Disease of the nucleus of the nerve	Muscular disorders of the face	
Disease of the midbrain		

Table 4

CONDITIONS THAT MAY CAUSE PALSY OF THE CRANIAL NERVES

First Nerve	Fourth Nerve	Eighth Nerve
Basifrontal tumor	Inflammation or injury of the base of the brain	Tumor of the cerebellopontine angle
Endothelioma of olfactory groove	**Fifth Nerve**	Basilar meningitis
Fracture of the base of skull	Tumor of the cerebellopontine angle	Disease of the inner ear
Residual of meningitis	Tumor of the gasserian ganglion	Familial degeneration
Second Nerve	Tumor of the nasopharynx	Fracture of base of skull
Multiple sclerosis	**Sixth Nerve**	Toxic neuritis (mumps, tobacco, alcohol)
Retrobulbar neuritis	Intracranial pressure	**Ninth and Tenth Nerves**
Basifrontal tumor	Otitis media	Retroparotid tumor
Basilar meningitis	Lesions at the base of skull	Injury, as in thyroidectomy
Secondary optic atrophy	**Seventh Nerve**	**Eleventh Nerve**
Primary optic atrophy	Inflammation (Bell's palsy)	Injury
Third Nerve	Tumors or inflammation at the base of the brain	Retroparotid tumor
Inflammation or injury of the base of the brain	Fracture of the base of the skull	Inflammation
	Peripheral neuritis	**Twelfth Nerve**
		Retroparotid tumor

ods such as the colored glasses for differentiating images, and even then with some difficulty.

Lesions of this nerve, especially isolated ones, are not common and their detection is rare. The nerve is subject to the same disease processes as

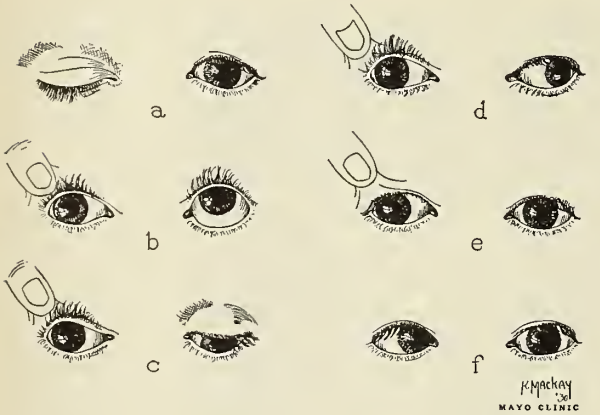


Fig. 1. *a* to *e*, Manifestations of complete palsy of the right third cranial nerve: *a*, ptosis; *b*, position of the eyes on looking upward; *c*, position of the eyes on looking downward; *d*, position of eyes on looking to the left; *e*, position of eyes on looking straight forward; *f*, appearance of the eyes in complete palsy of the right sixth cranial nerve on looking straight forward.

the third nerve, with which it is closely associated.

FIFTH OR TRIGEMINAL NERVE

The fifth nerve, the largest except the optic and composed of three divisions, sends the branches of the first division, or ophthalmic nerve, into the orbital cavity through the superior orbital fissure; the second division, or maxillary nerve, leaves the skull through the foramen rotundum, and the third division, or mandibular nerve, leaves the skull through the foramen ovale. The nerve supplies fibers carrying pain, temperature and tactile sensibility to the face and fore part of the scalp as well as to the mucous membrane of much of the oral and nasal cavities and tongue. It also has a motor root supplying the muscles of mastication. From a partial lesion of the nerve a patient might notice numbness of the face on the side of the lesion. A complete lesion would cause the patient to notice complete anesthesia of the face and there might be some trouble in chewing food on the side of the lesion. If the lesion has existed for a considerable time, there may be trophic disturbances of the eye, wrinkling of the cornea or corneal ulcers on the side of the lesion. In case of complete lesion, the examiner would notice a defect of the masseter, and possibly of the temporal muscle and the lower jaw would deviate to the paralyzed side because of paralysis of the pterygoid muscle (Fig. 2). The patient would not feel pin pricks, cotton wool, or heat and cold



Fig. 2. Manifestations of palsy of the motor branch of the fifth nerve; *a*, right pterygoid palsy, jaw deviating to the side of the lesion; *b*, atrophy of the left masseter.

stimulation over the side of the face. The cornea would be so insensitive that it could be touched with cotton or a pin head without the patient's awareness. In cases of apparent lesions of the fifth nerve the following possibilities must be eliminated: (1) paresthesia of the face such as is seen in certain cases of psychosis; (2) syringobulbia (cavity in the brain stem); (3) other lesions of the brain stem, and (4) lesions of the upper cervical portion of the spinal cord.

Lesions (usually partial) of the fifth nerve that may cause palsy are: (1) tumor of the cerebellopontine angle, which is one of the most common causes, (2) complete lesion of the fifth nerve in cases of tumor of the gasserian ganglion, and (3) tumor of the nasopharynx.

SIXTH OR ABDUCENS NERVE

The sixth nerve enters the orbital cavity through the superior orbital fissure. It is a motor nerve to the external rectus muscle of the eye. From a partial lesion of the nerve the patient might notice diplopia in looking in some directions. From a complete lesion the patient would have diplopia. In case of complete lesion the examiner would notice internal strabismus on the side of the lesion, and to demonstrate the defect the patient should be asked to look to the extreme side of the lesion, in which case the eye would not move toward the external canthus. If the sixth nerve seems to be paralyzed, the following conditions must be eliminated: (1) de-

fects of muscle, (2) asymmetry of the eyes, and (3) disease of the brain stem.

Palsy referable to the sixth nerve may be caused by (1) intracranial pressure, (2) sometimes by otitis media (Gradenigo's syndrome), and (3) sometimes by lesions at the base of the skull.



Fig. 3. *a*, Complete palsy of the left facial nerve; *b*, inability to wrinkle left side of forehead; *c*, inability to close left eye; *d*, inability to show teeth on left side; *e*, inability to whistle out of left side of mouth; *f*, inability to contract left platysma.

SEVENTH OR FACIAL NERVE

The seventh nerve leaves the skull through the stylomastoid foramen. It has a long circuitous course. It supplies the muscles of the face and ear and the taste fibers to the anterior two-thirds of the tongue. If it were partially paralyzed, the patient would notice inability to use the facial muscles naturally. In complete paralysis the patient would not be able to move the muscles of the paralyzed side, such as in wrinkling the forehead, closing the eye, whistling, showing the teeth, or drawing the corners of the mouth down (Fig. 3). If the lesion is complete, sometimes patients notice loss of taste on the side of the lesion. The effects of the lesion are most obvious to the examiner in asking the patient to perform these movements. Taste can be tested by placing sour, bitter, salty, or sweet objects on the anterior two-thirds of the tongue, and on the side of the lesion, and having the patient point to a chart with the names of the tastes on it. When there appears to be a lesion of the seventh nerve, the following conditions should be eliminated: (1) lesion of the nucleus of the nerve; (2) lesion of the facial region of the motor area of the brain (involves only lower part of face); (3) asymmetry of the face; (4) hematrophy of the face; (5) hemihypertrophy of the face; (6) edema of one side of the face; (7) contracture of one side of the face; (8) disorders of the muscles per se, such as muscular dystrophy and myasthenia gravis.

If palsy referable to the seventh nerve is present, the commonest causes are: (1) inflammation (Bell's palsy); (2) tumor or inflammation involving the base of the brain; (3) fracture of the base of the skull, and (4) sometimes in severe peripheral neuritis bilateral palsy of the seventh nerve which is sometimes difficult to recognize but is usually associated with other types of palsy of the cranial nerves.

EIGHTH OR VESTIBULO-ACOUSTIC NERVE

The eighth nerve subserves the functions of hearing and of equilibrium. From a partial lesion of the caustic portion of the nerve the patient may notice defect in hearing. Complete lesion produces absolute deafness. The examiner may, by rough tests, such as watch tick, elicit defects. Newer methods have recently been developed for more accurately measuring the defects of hearing. Partial or complete lesion of the vestibular portion may not be noticed by the patient, but while a lesion of this nerve is being produced, vertigo may be prominent. In cases of apparent palsy referable to the eighth nerve, the following conditions must be eliminated: (1) obstructive deafness; (2) defective intelligence; (3) Schilder's disease; (4) disease of the midbrain, and (5) pineal tumor.

Conditions that may cause palsy of the cranial nerves are: (1) tumor (unilateral) of the cerebellopontine angle; (2) basilar meningitis; (3) inflammatory disease of the inner ear; (4) familial degeneration of the eighth nerve; (5) fracture of the base of the skull, and (6) toxic neuritis of the eighth nerve, such as occurs during mumps and after excessive use of alcohol and tobacco.

NINTH OR GLOSSOPHARYNGEAL NERVE AND TENTH OR VAGUS NERVE

The ninth and tenth nerves leave the skull through the jugular foramen. It seems impossible at present completely to distinguish the function of one of these nerves from the other. The ninth nerve supplies the taste fibers to the posterior third of the tongue, motor fibers to the stylopharyngeal muscle, and probably sensory fibers to the pharynx. The tenth nerve probably supplies motor fibers to the constrictor muscles of the pharynx and soft palate. It supplies the motor fibers to the vocal cords, and afferent and efferent fibers to many of the thoracic and abdominal visceral structures. It is doubtful whether a patient would notice symptoms from a partial or complete isolated lesion of the ninth nerve. A lesion of the tenth nerve would result in hoarseness and inability to swallow properly.

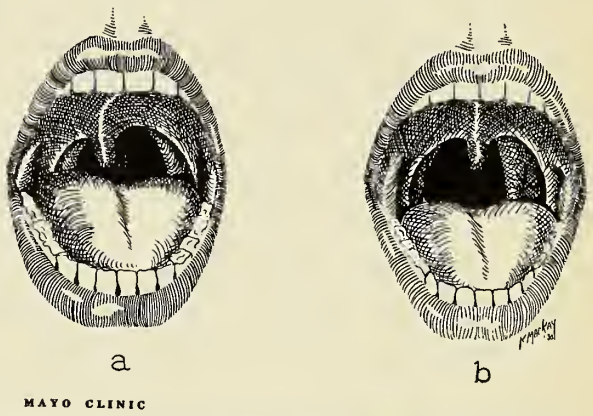


Fig. 4. Manifestations in palsy of the ninth and tenth cranial nerves: *a*, palsy of the left soft palate; *b*, palsy of the right constrictor of the pharynx.

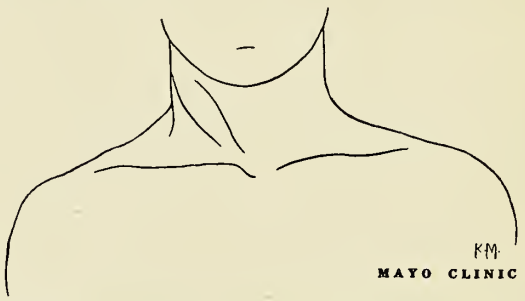


Fig. 5. Appearance of palsy of the left sternomastoid muscle. Manifestations of palsy of the eleventh cranial nerve.

The examiner could elicit weakness on one side of the soft palate by having the patient say "Ah," and of the pharyngeal muscles by putting a tongue depressor against the posterior pharyngeal wall to initiate a gag reflex (Fig. 4). In the presence of a complete lesion the laryngoscope reveals the vocal cord in the cadaveric position. If the lesions of the ninth or tenth nerve are suspected, the following conditions must be eliminated: (1) hoarseness due to laryngitis; (2) difficulty in swallowing due to an obstructive lesion of the esophagus or nasal obstruction, and (3) lesion of the medulla, such as that manifested by symptoms referable to occlusion of the posterior inferior cerebellar artery.

Conditions that may cause palsy of these cranial nerves are: (1) retroparotid tumor, or tu-

mor invading that region, and (2) injury, as in thyroidectomy.

ELEVENTH OR SPINAL ACCESSORY NERVE

The eleventh nerve makes its exit from the skull through the jugular foramen. It supplies

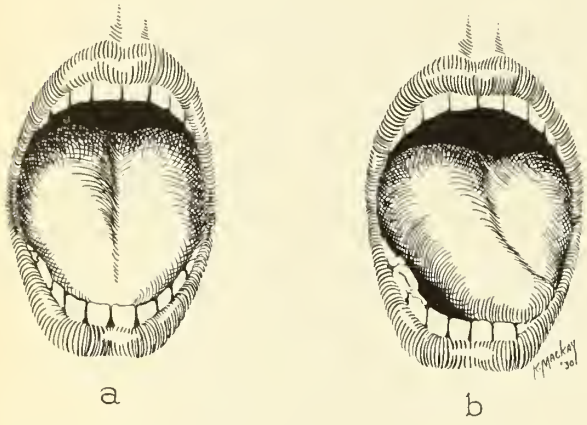


Fig. 6. Manifestation of palsy of the twelfth cranial nerve: *a*, normal tongue; *b*, palsy of the left twelfth cranial nerve, showing the tendency of the tongue to deviate to the side of the lesion.

the motor fibers to the upper portion of the trapezius and to the sternomastoid muscles. Partial or complete lesions would be known to the patient by inability to elevate the shoulders, as in shrugging (Stewart). The examiner would notice weakness and lack of prominence to the sternomastoid muscle by turning the patient's head away from the side of the lesion (Fig. 5). In cases of apparent lesion of the eleventh nerve, the following conditions should be eliminated: (1) arthritis of the shoulder or neck, and (2) monoplegia.

Palsy of this cranial nerve may be caused by (1) injury, not infrequently; (2) retroparotid tumors, and (3) inflammation.

TWELFTH OR HYPOGLOSSAL NERVE

The twelfth nerve makes its exit from the skull through the canalis hypoglossi. It is a motor nerve and supplies fibers to muscles of the tongue. If the nerve is partially paralyzed, the tongue is not so facile in its movement as normal, especially to the side opposite the lesion. If complete lesion is present, the tongue protrudes to the paralyzed side (Fig. 6). The patient notices difficulty in talking. The examiner may elicit weakness of the tongue by having the patient push the tongue into each cheek as far, and with as much force, as possible. Conditions that must be eliminated before palsy of the cranial nerves can be considered are: (1) nuclear lesions, as in bulbar palsy; (2) pseudobulbar palsy, and (3) sore tongue.

If a lesion of the twelfth nerve is present, retroparotid tumor is the most probable cause.

COMMENT

Complete paralysis of an isolated nerve (except the fourth) supplying the muscles of the eye produces a relatively simple and easily detected clinical picture. Partial or complete paralysis of more than one nerve may make the resulting clinical syndrome difficult to interpret.

There may be much pain in the distribution of a nerve such as the fifth or ninth, without demonstrable defect in the sensory or motor functions of these nerves.

During and following the epidemic of influenza in 1918, more patients were seen with partial palsy of the cranial nerves (especially of the third, fourth and sixth nerves) than had been seen previously. Many of these patients recovered but in some instances typical sequelæ of epidemic encephalitis developed.

Often the first symptom of nasopharyngeal tumor is pain in the region of the distribution of the fifth nerve and this nerve usually is involved early. Such tumors are probably responsible for more cases of palsy of the cranial nerves than any other cause; the palsy usually is confined to the side of the tumor. Retroparotid (mixed) tumors usually involve the ninth, tenth and eleventh nerves and sometimes the twelfth nerve, and produce the Jackson, or jugular foramen syndrome. Tumors of the acoustic portion of the eighth nerve almost invariably involve the fifth nerve on the side of the lesion.

Syphilis and tuberculosis involve especially the nerves to the optic muscles. Fractures through the base of the skull frequently involve the seventh and eighth nerves, although others may be affected as well.

Although it may not be easy to determine in the case of a motor nerve whether the muscle, nucleus of the nerve, or upper motor neurone is involved, the site of the lesion can often be determined. If the muscle is involved, the texture of the muscle as determined by palpation or biopsy may be of value. Also muscles in widely

separated regions may exhibit signs of disease. If the nucleus of the nerve is involved, muscular atrophy and fibrillary twitchings are usually seen in the muscles supplied by the nerve. In case a lesion of the upper motor neurone is suspected, the presence of signs elsewhere caused by the upper motor neurone, such as Hoffman's or Babinski's signs, may help to cast evidence in favor of such a conclusion. In the case of lesions of the sensory nerves, one must always rely on the subjective sensations and reactions of the patient. These are full of pitfalls, the avoidance of which, nevertheless, becomes an art of the experienced neurologist.

Thus if palsy of the cranial nerves seems to be present, its presence should be proved, if possible. After its presence is fairly well established the etiologic agent may be strongly suspected or even fairly well proved by the aid of information derived from careful history taking, by a careful examination of the whole body, and by the aid of well selected clinical tests. There is no place where careful day-by-day observation is so essential.

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STUDY OF INFLUENZA MORTALITY IN SIX EPIDEMICS 1920-1929

The Public Health Service has recently completed a study of influenza mortality in six epidemics. This study is based on weekly death rates from respiratory diseases recorded as influenza and pneumonia in about 95 cities of the United States during the period 1920-1929.

From January 1, 1920, to the middle of 1929 six epidemics of more or less national extent have occurred in the United States—1920, 1922, 1923, 1926, spring of 1928, and the winter of 1928-29. Judging by the rates in the 95 cities, which seem to be only slightly higher than rates for the country as a whole, these six epidemics caused in excess of the normal or expected seasonal mortality from respiratory diseases recorded as influenza and pneumonia, approximately 250,000 deaths in the country as a whole—a total of nearly one-half as many deaths as occurred in the United States during the great pandemic of 1918-19. About one-fifth of these deaths, or 50,000, occurred during the recent epidemic of the winter of 1928-29, and two-fifths, or 100,000, occurred during the sharp epidemic of the early months of 1920.

Although these six epidemics were more or less nation-wide in extent, the various sections of the United States were by no means equally affected. In the instance of several of the smaller epidemics there appeared to be whole sections of the country that were not affected. On the other hand, certain sections of the country experienced fairly sharp epidemics in years when the rates for the country as a whole did not indicate any influenza-pneumonia deaths in excess of the median weekly rates. An example of this is an epidemic in the West South Central cities which occurred in the early months of 1925, a year when the remainder of the country appeared to be relatively free from influenza.

The point of origin and direction of progress of these six epidemics varies a great deal. Nearly every one of them arose in a different section of the country. The 1920 epidemic arose in the East North Central section and progressed very rapidly to all other sections of the country. The 1922 epidemic arose in the East, probably in the Middle Atlantic section, and the 1923 epidemic arose in the East South Central section. The 1926 and the 1928-29 epidemics arose on the West Coast, and the little epidemic of the spring of 1928 probably arose in the Mountain or West South Central section.

The rate of progress across the country varies a great deal in the different epidemics. Considering the 95 cities as a whole, however, there is more uniformity in the length of the epidemic. In 1920 the central half of the deaths occurred in a period of about 16 days. In the epidemics of 1928-29, 1922, and 1926 the central half of the deaths occurred in periods of 21, 22, and 23 days, respectively. In the small epidemic of the spring of 1928 the period was 27 days, and in the epidemic of 1923 the period was 30 days. The 1923 epidemic seems to show the least time-concentration of any of these recent outbreaks. In the case of all the other epidemics the excess rate rose and fell at about the same rate, but in 1923 the rise to the peak was considerably slower than the fall of the curve to the normal level again.

ENCEPHALITIS*

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SINCE the onset of the first great epidemic in 1917, the most characteristic feature of epidemic encephalitis has been its protean manifestation and the widespread dissemination of its involvement of the nervous system. No mere enumeration of signs and symptoms, or the orderly grouping into clinical types, can give an adequate picture of the symptomatology of this disease. The lesions giving rise to the symptoms may be scattered from the frontal pole to the conus medullaris. For that reason the grouping into clinical types of this disease has been misleading. For a brief presentation the symptoms may be grouped into general and focal during the acute stage, and the general aspects of the chronic stage considered.

Fever is present as a rule during the acute stage, but is usually of only moderate intensity —99 to 101 degrees—and of short duration. In a large majority of cases headache, either moderate or severe, is usually present. Disturbance of the sleep mechanism is common. Lethargy was a very prominent feature of the early epidemic, but its prominence has markedly decreased in recent years. Insomnia in a severe and persistent form was quite common in later epidemics. Insomnia by night and drowsiness by day is often encountered. Delirium, excitement, clouding of consciousness and disorientation are the mental signs most often met in the acute stage.

In considering the focal symptoms it must be borne in mind that the portion of the central nervous system least spared is the mid-brain, brain stem and the basal ganglia. The symptoms, therefore, are in the main directly related to these regions. The cerebral cortex, pyramidal system, spinal cord, and spinal roots are occasionally affected, but infrequently in relation to the upper mid-brain and basal ganglia. Ocular disturbances are the most constant and important of the focal symptoms, and are present in the great majority of cases. The subjective complaints of these symptoms are blurring of vision and diplopia. Inequality and irregularity of the pupils are common; in addition the reaction of the pupils to light and in accommodation may be absent. Papilledema and, rarely, choked disc may be present. Ptosis, usually slight, and either unilateral or bilateral, is quite frequently found. External ophthalmoplegia caused by impairment usually of the third or sixth cranial nerves is another important focal symptom. Conjugate ocular convergence is frequently impaired. Facial weakness, either of the upper or lower motor neuron type, and usually slight and transitory, is often found. Vertigo is sometimes encountered. Choreiform movements, myoclonus, hiccough and tremor have often been met with in the acute stages of the past, but are not so common at present. The reflexes are variable. Occasional signs of meningeal irritation, of stiff neck and positive Kernig are found. The spinal fluid may be negative. Moderate increase of lymphocytes, increased pressure, a luetic gold curve, and normal or increased sugar content, on the other hand, are common spinal fluid findings.

There is no doubt but that the virulence of the disease has diminished until now the cases we encounter are not so severe in their manifestations. For this reason it is often difficult to make a correct diagnosis. In the recent cases we have found the most prominent symptoms to be headache, blurred vision, insomnia or drowsiness, moderate fever usually of short duration, and occasional rise in cell count in the spinal fluid. The onset is often insidious. The usual seasonal incidence occurring during the winter months has disappeared, until now cases are more or less sporadic.

It is now recognized that epidemic encephalitis is usually a chronic disease. The so-called sequelæ consisting of the Parkinsonian syndrome, hypertonia, tics, blephorospasms, respiratory disturbances, etc., following the acute stage, are merely manifestations of the infection which has become chronic. These appear at variable times after the acute stage. In fact, we have frequently found patients having unmistakable signs of chronic encephalitis who did not remember having been sick, and did not know they had encephalitis. In some instances, the masked

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1930.

facies and beginning stiffness, with the peculiar flexed attitude, have been noted immediately after the acute stage. On the other hand these symptoms may not have made their appearance until four years, or longer, after the acute stage.

In considering the treatment of epidemic encephalitis, we are obliged to consider the treatment of two distinct classes of cases: (1) the acute cases; (2) the advanced cases, which exhibit the Parkinson syndrome or mental symptoms.

The treatment must necessarily vary in the consideration of these two groups, for in the first we are dealing with an acute infection accompanied by inflammation and exudation, while in the second group we are dealing with symptoms which exist, due to organic and degenerative lesions in the brain, as a result of acute infection and inflammation.

The acute cases.—The treatment of the acute cases is best managed by hospitalization, with exclusion of all visitors and members of the family, and allowing as complete mental rest as is possible. There should, of course, be skilled nursing care. Febrile symptoms and restlessness are controlled in the usual manner, with baths and the use of ordinary sedatives such as would be used in any acutely sick case. Spinal drainage is useful, particularly in cases where markedly increased spinal fluid pressure is observed. Drainage of the spine may be made daily or less often, as the individual case seems to warrant. Lumbar puncture is performed in the usual manner and the spinal fluid allowed to drain until the pressure is reduced to normal. The amount of fluid removed at each drainage is of no particular consequence, and varies in the individual case, as well as in different cases. The usual amount removed at a single drainage is from one-half to one and one-half ounces, depending upon the degree of increased pressure. One observation we have made is that in cases where the spinal fluid pressure is markedly increased, the prognosis is much brighter than in those cases where there is a normal or decreased pressure.

In the hemorrhagic type of case, spinal drainage may be made as often as twice in twenty-four hours to relieve intracranial pressure. The examination of the spinal fluid is always of value in determining the progress of the case, particular attention being paid to the rise or fall of the cell count in the fluid.

Specific medication, unfortunately, is lacking in the treatment of epidemic encephalitis. Assuming this disease to be caused by a bacterial virus, the logical route of attack is by means of intravenous therapy with virocidal remedies. To this end, various intravenous medications have been used, such as: sodium salicylate, mercurochrome, sodium iodide, neutral acriflavine.

The sodium salicylate treatment has been advocated chiefly by French clinicians, and as administered by them consists in daily intravenous injection of sodium salicylate in large doses. A solution of ten or fifteen per cent is used and the patient receives a daily injection, varying from two to five grams of sodium salicylate. We have never seen any particular benefit from this treatment. Venous thrombosis is particularly apt to occur following this administration of sodium salicylate, and no startlingly good effects have been observed. It is quite probable that just as much good would be accomplished with large doses of sodium salicylate given by mouth.

Intravenous use of mercurochrome we have tried very thoroughly, using a one per cent solution, and have found it to be of no value whatsoever.

Likewise, sodium iodide has proven inefficient in these acute cases. Of all the various forms of therapy, we subscribe solely to the use of neutral acriflavine, with which we have treated a large number of cases, with surprisingly beneficial results in a large percentage of those treated. Briefly, the technic for the use of acriflavine is as follows: The recrystallized and repurified salt is used, the commercial product being unfit for intravenous injection. The solution to be injected must be prepared freshly, each day, and must not be allowed to stand for any length of time in the light, because it is very unstable and breaks down readily. The solution prepared is one-half of one per cent in strength. Of this, 10 c.c. are injected intravenously every day for ten consecutive days. The injection must be made very slowly, taking about five minutes to inject the solution. If given too rapidly, there will be a marked respiratory reaction, which, while not at all dangerous, is a matter of great discomfort to the patient. During the injection there will be noted a flushing or mottling of the skin, lacrimation, and possibly sneezing or

vomiting. These symptoms are of no consequence whatsoever, and do not warrant interruption of the treatment. Great care must be used to have the needle in the vein, for extravenous infiltration of the tissues with the solution of acriflavine will always cause an acute local reaction and a sloughing of the tissues so infiltrated. After the first series of ten daily injections is completed, a period of rest for eight to ten days is given, and then a second series of injections is used in the same manner. A third series may be used after a second rest period, if it is deemed necessary.

In a large series of cases treated by the above described method, during the last four years, not a single adverse effect has been observed. Marked recession of clinical symptoms, both subjective and objective, has been observed in a large percentage of cases. In several cases this treatment has acted with almost the same specific effect as diphtheria antitoxin, causing a very rapid and complete recession of symptoms, with recovery of the patient. Marked reduction in spinal fluid cell counts has been observed. In one instance the spinal fluid cell count of approximately 500 lymphocytes was reduced to less than 200 lymphocytes after three injections. Improvement, if it occurs, usually begins after the third or fourth injection of this drug.

The advanced cases. — Unfortunately, the treatment of advanced cases of epidemic encephalitis, particularly those which exhibit the Parkinson syndrome, is still in the experimental stage. Nothing curative can be done for these patients. Various forms of treatment have been used, with varying degrees of success. The fact that these patients show symptoms which are indicative of organic and degenerative lesions in the brain makes a cure out of the question. Relief of symptoms is the most that can be hoped for. The management of this type of case includes, briefly, the following:

Removal of foci of infection, particularly in the teeth, sinuses and throat.

Careful regulation of elimination.

Proper regulation of diet, with attention to the general nutrition of the patient.

Physiotherapy, such as general massage, warm baths, and the use of diathermy.

Control of the life of the individual, to promote as far as possible emotional balance.

In addition to the above, various forms of medication have been used, with varying degrees of success. Stramonium is highly recommended in the form of powdered dry leaves. It is administered in capsule form, beginning with a dose of one grain three times a day, increasing the amount one grain a day until a maximum of fifteen grains a day is given. The dose is then decreased, gradually, until a dose of eight grains a day is reached, which is maintained for a week or ten days. A period of rest of a few days is then given and the procedure repeated.

In our experience, the greatest benefit has been given these patients by the use of tincture of belladonna, administered by mouth, for purposes of controlling sialorrhea. An initial dose of three drops three times a day is increased by one drop a day until the point of tolerance is reached, as shown by symptoms of belladonna poisoning. Patients often reach a maximum of thirty drops, three times a day, before having to discontinue this drug. In addition to this, intravenous acriflavine, as outlined above, and intravenous sodium iodide, 31 grains, three times a week until a point of saturation is reached, have proven useful. Hyoscin in small doses, administered daily, is of use in cases where there is a marked tremor. Unfortunately, little can be accomplished for the average case of this type, and while some temporary benefit may be obtained, lasting results are very disappointing.

The problem of post-encephalitic syndrome is one of the most formidable which confronts the profession today, and it is undoubtedly no nearer solution now than it was five years ago. Institutional care for these pitiful cases seems to be one solution of the problem, and some agitation has already been made for State Institutions to care for these sufferers.

THE SIGNIFICANCE OF TEMPORARY BLINDNESS*

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THE loss of any part of one's vision is an occasion for apprehension, and the cause of this loss becomes the object of intensive search. Partial loss of vision, or temporary total loss of vision, is not uncommon as a symptom of disease or disorder affecting the visual pathways, or of a constitutional disease or disorder. Temporary blindness, particularly, intrigues the physician. The absence of pathologic changes on examination of the eyes may be of as much importance as if definite changes were to be found in some portion of the eye, and it is well known that in some cases of temporary blindness the examination gives negative information.

If blindness occurs in the course of an illness, or following a surgical procedure, considerable apprehension may be aroused as to whether the loss of vision will be permanent. Indeed, permanent blindness may occur as a complication in rheumatic fever, Bright's disease, multiple sclerosis, tabes, meningitis, influenza, and in a number of less common acute, chronic, or recurrent diseases. From the effects of emboli following surgical operations in the pelvis, or on the extremities, temporary loss of vision occasionally is encountered, and even permanent blindness has been reported. Procedures apparently as harmless as aspiration of fluid from the pleura may bring on sudden loss of vision, to the consternation of the surgeon and to the dread and alarm of the patient and his friends.

Whether temporary blindness or permanent blindness is to be the lot of one in whom loss of vision occurs is often a matter of the extent to which the process directly responsible has gone. Many conditions which lead to temporary blindness lead also to permanent blindness. If changes in the media of the eye or atrophy of the nerve have been extensive, it can be definitely determined that vision never can be restored. Because of the difficulty in determining whether or not blindness will be only temporary, and because of the necessity for determining the cause early in the course of the affliction, thorough examination in cases of blindness becomes of great importance. For the proper examination of a patient who complains of temporary blindness, there is required a knowledge of the pathology of the eye and the visual pathways; but often it is necessary for the physician to match his wit against that of a malingerer or one who is actually deceived about his own vision. A carefully obtained anamnesis is the first step in the examination. Not only is it necessary to listen to the story of the patient but it is well to get this history independently from relatives or others who have observed him. Loss of vision, without adequate pathologic changes to account for it, is found in persons of nervous instability. The history may be of importance in arriving at a diagnosis.

FUNCTIONAL BLINDNESS

Hysterical amblyopia.—Case 1. A boy, aged eight years, in apparently good health, was the only child of a family that lived in a small Canadian village. He had an abnormally large head, but he had grown up among his playmates, and no mention was ever made of this condition in his hearing. He entered kindergarten and was making satisfactory progress when the parents moved to another part of town and the boy was placed in another school. A few weeks after he had been transferred to this school, he was sent home with a note from the teacher, saying that the boy complained of headaches, and considerable drowsiness, and that he was unable to see writing on the blackboard that was plainly visible to other children in the room.

A general examination failed to show cause for the boy's poor vision. An attempt was made to keep him in school, but the defect in vision increased until he was unable to get about alone. Physicians near his home, unable to understand any reason for his complaint, referred him to specialists in another city. The father was told that the boy had a tumor of the brain, and that in all probability he would never see again. It was because of this diagnosis that physicians at The Mayo Clinic were consulted.

Early in the course of the examination, and after a thorough search had failed to reveal any disorder or disease of the eyes, the father chanced to remark that in the neighborhood in which he first lived the children were very careful never to mention this boy's deformity, so that the boy himself apparently was unaware of any difference between himself and his playmates. After he had entered the new school, he was taunted by his schoolmates with the epithet "big-head," an insult which

*From the Section on Ophthalmology, The Mayo Clinic, Rochester, Minn. Read before the North Dakota State Medical Association, Bismarck, N. D., May 27, 1930.

evidently hurt him and gave him a feeling of inferiority. The defense reaction of this child was to remove himself from the children who would hurt him and his chief defense took the form of hysterical blindness.

The boy was under observation for one week while he was at the clinic with his father and enjoyed the privilege of frequent visits to the zoölogical park and other places of interest. Complete vision was restored merely by a change of environment.

Comment.—Hysterical amblyopia, sometimes spoken of as retinal anesthesia, is functional blindness without pathologic change of the eyes or visual pathways. It is more common among women than men, and more common among young persons and children than older persons. It is not infrequent among girls in their teens who find some difficulty in adjusting themselves to disagreeable social circumstances or exaggerated parental solicitude. It is always bilateral, usually gradual in onset, and unassociated with headache, pain, or constitutional disease. The diagnosis is often suggested by the history, and is established by elimination of pathologic processes. It is confirmed by the restoration of good vision, by whatever effective means may be adopted. In some cases, I believe hysterical blindness becomes permanent.

It is essential, in the treatment of hysterical amblyopia, that one of two things be brought about: that the conditions under which the amblyopia developed should be changed, or that a situation be substituted which is more intolerable than the first. Most patients with hysterical amblyopia will recover their vision if kept in isolation, with their eyes bandaged and on a milk diet. In treatment of young persons, it is necessary that only such attention as is necessary be provided and that the company of parents or other visitors be not allowed. Two weeks of such isolation is usually sufficient to bring about restoration of vision. Recurrences among young persons are rare. Substitution neurosis may appear, but if steps are taken to correct the original cause of the disturbance, useful vision as a rule is maintained.

Amblyopia associated with migraine.—This type of functional neurosis is much more difficult to understand and far more difficult to treat. The blindness may take the form of scotoma, of hemianopsia, or even of complete blindness. The blindness usually precedes a severe migrainous headache, and may persist for hours or days after the headache has disappeared. Frequently, warning of the onset of blindness is given in the form of aura or floating spots before the eyes. Mild cases proceed no farther than scintillating scotoma or subjective sensations of flashes of light. In such cases not all attacks of migraine are associated with amblyopia, but severe attacks of headache, with some degree of blindness, may be frequent and often periodic. Although they are more common in persons about the age of fifteen to twenty-five, they may persist well beyond the age of fifty.

There must be other criteria, however, sufficient to establish the diagnosis of migraine, before one can assume that blindness associated with headache is not significant of organic disease. I have seen total permanent blindness of one eye that seemed to be due to repeated attacks of migraine.

BLINDNESS DUE TO PRIMARY DISEASES OF THE EYE

Glaucoma.—Temporary blindness is an early and frequent sign in simple glaucoma. Transient, high intraocular tension brings about definite reduction in vision through cloudiness of the cornea. The cloudiness clears away, with restoration of vision when the tension is reduced. As the glaucoma is usually limited to one eye, the blindness is also limited to one eye. I have had under observation a patient whose intraocular tension could be changed at the will of the physician from less than normal to more than five times normal, by the alternate instillation of homatropine and eserine. With each rise of tension, the vision would be reduced so that only perception of light remained. When the tension was reduced, vision came back to 6/5. The condition was limited to one eye. The glaucoma, however, could not be controlled indefinitely by miotics; so it became necessary to resort to operation to bring about permanently low tension. The more frequent attacks of hypertension from which the patient had suffered caused partial atrophy of the optic nerve, and partial permanent loss of vision in the eye resulted. It is possible for a person to have a marked increase of tension in both eyes at the same time, with marked reduction of vision. Careful examination of the eyes during the time when vision is poor will clearly reveal the diagnosis. Treatment instituted early in the course of the disease often

may save considerable vision which otherwise would be permanently lost.

Interstitial keratitis.—One of the most alarming inflammations of the eye, as well as one of those which gives a good prognosis, is interstitial keratitis, an inflammation of the cornea of children and young adults afflicted with hereditary syphilis. Although it is usually found in children between the ages of eight and sixteen years, it sometimes appears earlier in childhood. One eye is affected a few days to a few weeks in advance of the other, but both eyes are always affected, usually to the same extent. The second eye will become involved in spite of the most vigorous efforts to ward off its involvement. Hereditary syphilis often is not recognized until the onset of keratitis and frequently it becomes the duty of the oculist to investigate the family for other evidences of the disease, and to inform the parents of the seriousness of the malady. Delayed keratitis, occurring after the age of twenty-five years, may run the same general course as keratitis in younger persons, but appears to be more protracted. The end-result is the same. The acute stage lasts for six to ten weeks. During this time the patient is temporarily blind, with photophobia and lacrimation. During convalescence there is little, if any, pain, but light is poorly tolerated, necessitating the use of dark glasses until the cornea is clear. The prognosis as regards vision is good.

Keratitis associated with conjunctivitis is sometimes a complication of the exanthematous diseases, particularly measles, scarlet fever, and smallpox. Here the disease frequently takes the form of corneal ulcers which leave white scars in the cornea, a permanent obstruction to vision.

DISEASES OF THE OPTIC NERVE

Inflammation of the optic nerve is a common cause of temporary blindness, seen most often as a unilateral affection, and appearing as a complication in a large number of general conditions and a few local diseases. Optic neuritis is always accompanied by reduction in vision when it eye. Indeed, the cloudiness of vision may be the occurs in a previously healthy and functioning first symptom noticed by the patient. Although usually bilateral, it may be unilateral or alternating. It may be secondary to disease in the proximity of the optic nerve, although it is often metastatic from some chronic local or constitutional inflammation.

Syphilis.—Probably the most common cause of optic neuritis given in the literature and texts of twenty-five years ago was syphilis. Whatever the relationship was considered to be at that time, I am sure that it will not hold today. There are several reasons why we have to revise our ideas regarding the rôle of syphilis as one of the common causes of blindness, both as regards the optic nerve and the anterior segments of the eye. Let us not forget that in the last twenty-five years the Wassermann reaction has aided tremendously in determining the presence or the activity of syphilis, and that the diagnosis of syphilis in the face of repeatedly negative Wassermann reactions must be supported by a preponderance of positive evidence. Then, too, syphilis is recognized earlier and treated much more effectively than it was a few years ago. It is not uncommon, now, for the disease to be arrested before it reaches the secondary stage, and tertiary syphilis, except in forms of disturbances of the central nervous system, is rarely seen. Seldom is optic neuritis seen as a complication where large numbers of cases of primary and secondary syphilis are seen. It is asserted that the race is becoming immune to the disease and that it is noticeable in European as well as in American clinics that the severe secondary and tertiary lesions of syphilis, once so common, are conspicuously absent. Optic atrophy, or ocular tabes, still takes its toll in blindness, but there the loss of sight is permanent and not unexpected, for it occurs in about 10 per cent of the cases of syphilis of the central nervous system.

Retrobulbar neuritis.—The greatest controversy among oculists over optic neuritis rages about the causes of retrobulbar neuritis. This term should be applied only to those cases in which there has been a marked loss of vision, central scotoma, and retardation of pupillary reflex, without change in the optic disk or other obvious disorder of the globe or the media. The only symptom is loss of vision, of rapid onset unaccompanied by pain. Examination of the visual field will reveal a large central scotoma, loss of perception of color, and rise in the threshold of perception of light. In other words, there is a block along the conduction path of the retinal fibers, particularly in the macular bundle. It has been agreed that this block may be brought about (1) by pressure from an extraneural source, such as bulging sinuses, abscesses, tumors, or hemor-

rhages; (2) by local inflammation within the nerve or the nerve sheath through direct extension or possibly through metastasis, and (3) by toxins. If pressure from an extraneural mass can be demonstrated there is, in all probability, an answer to the question of the cause of the retrobulbar neuritis. The chief difficulty, however, has been to show conclusively that such pressure does exist in the absence of clearly demonstrable tumor and abscesses. Disease of the nasal accessory sinuses is held by a large group of outstanding oculists to be of such importance in retrobulbar neuritis that, regardless of rhinoscopic data and interpretation of roentgenograms, they will direct the opening of the paranasal sinuses by the rhinologist, and will assume all responsibility for the procedure, in the mistaken notion that ventilation and drainage of an apparently normal sinus is adequate to restore vision. A list of such cases can be supplied at will which on first consideration seem to support the argument that early surgical invasion of the sinuses is followed by restoration of vision in a few hours to a few days, and hence lends support to the theory that the retrobulbar neuritis in that case was due to disease of the sinuses. However, febrile treatment must be considered: foreign protein, without surgical invasion of the sinuses, has been used with equally good result. If it is necessary to ventilate and to drain the sinuses, how can the effect of protein therapy be explained? If equally good results are obtained, is it not better practice to use nonsurgical treatment and to avoid postoperative changes in the nose, that in themselves may give rise to discomfort and even disease?

It often has been demonstrated that a common cause of retrobulbar neuritis is multiple sclerosis, a disease of the nervous system that probably has no relation to any disease of the sinuses, although the rôle of focal infection in the production of multiple sclerosis is not clearly understood. Multiple sclerosis is a disease of young adults who often are apparently in good health. The symptoms, in mild cases, often are difficult to elicit and the disease may run for years before a satisfactory diagnosis can be made. In every case of retrobulbar neuritis in a young adult, multiple sclerosis should be thought of first, and in the absence of perfectly obvious causes of another nature, the treatment should be carried out along medical lines. Retrobulbar neuritis may be the only outstanding symptom of multiple sclerosis for years. I have recently seen, in a woman aged twenty-six years and in a man aged thirty-three years, the second attack of retrobulbar neuritis after ten years, with no ocular disturbance in the interim, and with gradually developing signs of multiple sclerosis during the last few years. In each case, vision was reduced barely to perception of light in one eye at the beginning of treatment and was restored to 6/6.

Almost complete blindness in one eye may be accompanied by partial blindness or hemianopsia in the other eye, a circumstance that may escape notice unless the visual fields of both eyes are carefully tested. Temporary blindness of one or both eyes, without change in the globe or disk, is most likely to be due to retrobulbar neuritis, but this diagnosis, once made, rarely should be used as an excuse or a reason for surgical invasion of the paranasal sinuses in the absence of visible pathologic change in the nose.

EMBOLISM, TOXEMIA, AND TOXICOSIS

It may seem rather incredible that sudden blindness should follow a simple procedure like thoracic puncture for pleural effusion; yet there are a number of authentic recorded cases. If an open cannula is employed in the puncture, air may be introduced into the veins, which, during a part of respiration, are under negative pressure. The general symptoms of air embolism, such as apprehension, fear of impending death, faintness, suffocation, and blindness, all come on suddenly, much to the consternation of the surgeon. The blindness is due to air in the arterioles of the retina, and the consequent ischemia. If only a small amount of air enters the vessels, the blindness may not be complete, and may clear away in a short while. I know of no case of total, permanent blindness from that cause.

Embolism of the retinal arteries is seen in cases of endocarditis and general vascular disease, including arteriosclerosis, more often, I think, in persons aged more than fifty years. Thrombosis of the retinal veins is probably seen as commonly as a result of arteriovenous compression or of disease of the wall of the vessel. There results infarction of the retina, with edema, hemorrhages, and exudates. A scotoma subtends the affected part of the fundus. If the central vessels of the optic nerve are occluded, permanent, total loss of vision results. In the toxe-

mia of pregnancy there sometimes occurs such edema of the retina that vision is reduced to the bare perception of light. The pathologic change is probably not limited to the retina, but involves the optic nerve in more or less severe optic neuritis, which may leave the patient totally blind if it persists for several weeks. In the active stages of retinitis, the choroid coat may be temporarily detached by serous exudate. I have seen two such cases with recovery of vision after elimination of the cause of the toxemia. Neuroretinitis, following miscarriage and subsequent uterine infection, may be followed by almost complete blindness, and constitutes one of the hazards of induced termination of pregnancy. Yet it sometimes becomes the duty of the oculist to decide, in a case of marked involvement of the eye in toxemia of pregnancy, whether vision can be restored without emptying the uterus. If pregnancy complicates multiple sclerosis, the issue is generally fatal. With the splendid prenatal care that most mothers now receive, the combination of toxic nephritis, high blood pressure, and albuminuric retinitis is less seldom seen. If the retinitis occurs late in the seventh month of pregnancy, expectant treatment may be adopted with a moderate degree of safety from permanent blindness, although every possible means should be adopted to combat the toxemia. In case of intractable hypertension, with albuminuria and retinitis, it is doubtful if many patients regain much of their vision if the condition has existed for more than six or eight weeks. Consideration of the termination of pregnancy is the only alternative to almost certain blindness in such cases, and must be undertaken, if at all, before irreparable injury has been done. In one patient under my observation the systolic blood pressure was lowered more than 100 points in twelve hours after the uterus had been emptied, and the retinitis began to clear away within a few days. Normal vision was restored after four months. It is the province of the general physician to determine the probable hazard of future pregnancies in women who have suffered retinitis with toxemia, but it is well known that women who have partial permanent blindness as a result of toxemia of pregnancy have gone through subsequent pregnancies without suffering the same complications.

If I were to mention all of the conditions which may be complicated with temporary blindness it would be merely to catalogue a number of them that are rarely encountered, or that are so well known that any further comment is uncalled for. Except in industrial centers, where factory workers are exposed to poisonous products, impure alcohol and tobacco probably head the list of poisons that produce blindness in varying degree. Quinine taken in large doses, as an ecbolic, will produce optic neuritis, with subsequent partial or total atrophy of the optic nerve. In ordinary doses, such as are given in the treatment of malaria for instance, it is a safe drug. The arsenicals, used in the treatment of syphilis of the central nervous system, particularly general paresis, have been suspected of producing optic atrophy. Further study of the effects of these drugs, however, would seem to indicate that only those patients who would have lost their vision through the disease had no treatment been given, have gone on to blindness. The drugs, administered in the same doses to persons free from disease of the central nervous system, have no effect on the eyes. It seems probable, therefore, that not the drugs, but the disease for which the drug is administered, must be held to account for blindness in cerebrospinal syphilis. The ocular conditions following injuries, diseases of childhood, septicemia, focal infections, constitutional diseases such as syphilis, tuberculosis, diabetes, anemia, toxemia from chemicals and drugs, hypertension, nephritis, tumor of the brain, and a host of otherwise insignificant disorders which may terminate in partial or complete temporary blindness, constitute an interesting chapter in the history of medical investigation and practice. Everyone who is engaged in the practice of medicine is concerned with the diagnostic signs revealed by the ophthalmoscope and the perimeter, and the well trained oculist is a most valuable consultant.

CIRCULATORY TESTS PREVIOUS TO AMPUTATION*

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THERE have been a number of tests recently developed to test the efficiency of the circulation in the extremities, but according to McKittrich and Root (1928), "At present no simple, practical, and accurate laboratory or clinical test is available by which the degree of circulatory disturbance in a given foot can be measured or by which the point at which amputation should be done is indicated. . . . Fortunately the patient usually gives sufficient clinical data to warrant an estimate of the circulatory condition of the foot sufficiently accurate for intelligent treatment."

Still some of these tests are of value in early diagnosis, in the differential diagnosis of these conditions, and also in giving corroborative evidence of the degree of circulatory disturbance. An attempt has been made in this paper to collect the various tests which have been proposed.

HISTORY

Frabricius Hildames (1560-1624) advised amputation at an early stage in gangrene and he advised that the incision should be made in the sound, and not in the decayed flesh.

Pott (1785) gives a good description of arteriosclerotic gangrene to which little could be added today. He states, "It frequently happens to persons advanced in life, but is by no means peculiar to old age. . . . It has by some been supposed to arise from an ossification of vessels, but for this opinion I never could find any foundation but mere conjecture." He advised allowing gangrenous toes to drop off of themselves.

Charcot (1856) called the fatigue and pain on exercise "claudication intermittente." Maurice Raynaud (1862) was the first to maintain that gangrene could occur without vascular occlusion. Billroth (1869) in speaking of arteriosclerotic gangrene said that we must amputate in the thigh as soon as the popliteal artery pulsation cannot be felt. Winiwarter (1879) used the terms "endarteritis" and "endophlebitis" in describing the condition of a man aged 57 with obliterative arterial disease of the extremities. From his description of the vessel pathology it is now evident that this was thromboangiitis obliterans. König (1887) first demonstrated that good results were obtained under careful aseptic operation in diabetic patients. Results were bad previous to the advent of aseptic surgery because the resistance of the tissues in the extremities was so low as a result of poor circulation. Marshall di Calvi was the first to call attention to the frequent relationship between diabetes and gangrene. Landlow (1892) described a large number of favorable results in senile and diabetic cases where a more distal amputation than through the thigh was done. Heidenhain (1891) so long as the gangrene involved the digits only, awaited a line of demarcation, but if it involved the foot he amputated every case above the condyles of the femur. In doing this he was influenced by the bad results he saw in lower amputations performed by Küster, but Küster also adopted a more proximal site for operation later. Buerger in 1908 established as a pathological entity the condition now often called Buerger's disease and called it obliterating thrombo-angiitis.

CLINICAL HISTORY

Some special features should be stressed in taking the history of these patients. What were the precipitating factors? Was it exposure to cold? Was it injury? Did it occur without any known precipitating cause? Is there abnormal fatigue in any part of the extremity? How much exertion is necessary to bring on this fatigue? Is there claudication? Is there rest pain? Have there been color changes, vasomotor disturbances, or phlebitis?

PHYSICAL EXAMINATION

Final opinion will be based largely upon physical findings. The following conditions should be looked for:

1. General appearance of the limb.
   a. Dry scaling atrophic skin.
   b. Irregularity of the nails.

*From the Department of Surgery of the University of Minnesota. Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

2. Rubor or cyanosis when the limb is in the pendant position.

3. Ischemia on elevation of the limb.

4. The absence of some or all of the usual arterial pulsations. Single pulses eluded detection in less than 1 per cent of 700 ward cases examined by Erb's assistants. One case (0.5 per cent) in 200 supposedly normal individuals was found by Buerger where the dorsalis pedis artery could not be elicited. An apparently normal foot without pulse in the popliteal space or below the groin means a highly developed collateral circulation. It is uncommon and means that gangrene is impending.

5. The angle of circulatory efficiency should be determined. The extremity is raised to a vertical position and if it does not become ischemic the angle of circulatory efficiency is zero. This is the result one should obtain if the circulation is normal. If the foot becomes ischemic the limb is gradually lowered until it assumes the normal pink color. The angle of circulatory efficiency is that through which it has been lowered. The magnitude of the angle increases in direct proportion to the impairment of the circulation.

6. Search should be made for phlebitis. Recurrent phlebitis of the superficial veins is frequent in thrombo-angiitis obliterans.

7. The temperature of the skin should be roughly determined by feeling with the hand. In severe circulatory disturbance the skin of the distal portion of the extremity will be appreciably colder. Abrupt change is felt in sudden occlusion with poor collateral circulation.

8. Changes in the extremity following heat and cold should be noted. In Raynaud's disease the appearance and circulation is entirely normal between attacks but cold will precipitate the attack.

After this examination has been completed one should perform any of the special tests which are indicated. The tests regularly used in this clinic are the determination of the oscillometric index, the salt solution test of McClure and Aldrich, and the Moszkowicz test for spread of hyperemia after temporary interruption of the circulation. The surface temperature is determined with a thermocouple only in special cases, for example, in thrombo-angiitis obliterans where lumbar sympathectomy is contemplated. Other tests have not been used, or rarely used, but are described in an attempt to collect all the various tests which have been proposed to determine the efficiency of the circulation in senile or diabetic arteriosclerosis, or in thrombo-angiitis obliterans. These tests are listed not according to their importance but in chronological order of their development.

Palpation for pulsation to determine the site of amputation was mentioned by Billroth in 1869. Palpation of the pulse and the sphygmograph was employed by Gussenbauer, but he concluded that it was not reliable.

Moszkowicz described in 1907 the test now known by his name. It is based upon the fact that a hyperemia occurs after temporary interruption of the circulation. An Esmarch rubber bandage is applied beginning at the distal end of the extremity and wrapping in a proximal direction until the entire extremity is bandaged and compressed by this bandage to express practically all blood, both venous and arterial, from the limb. The bandage is then allowed to remain in place for five minutes or more, when it is removed in the distal to proximal direction. The area is ischemic immediately after removal of the bandage, but this is followed by a hyperemia appearing uniformly over the bandaged area in about a minute or less in the normal individual. In the patient with circulatory disturbance this hyperemia creeps down the extremity and appears in normal time in the proximal portion, where the circulation is adequate, but below this level it spreads more slowly and irregularly. The greater the impairment of the circulation, the more slow the spread of hyperemia. Adequate collateral circulation, if present, gives a normal reaction, regardless of the condition of the main artery.

The explanation of hyperemia is not clear. Paralysis of vaso-constriction has been suggested. Moszkowicz thinks it is excessive flow following damming back. From injection experiments, Moszkowicz concluded that the arterial occlusion should be at the site of the hyperemia or a few centimeters higher. These injection experiments consisted of intra-arterial injections of colored dyes above a ligation of the artery and he noted the area of skin colored by the dyes.

To amputate 5-10 cm. above the line of hyperemia is prudent. The skin flaps are best taken from the side where the hyperemia reaches lowest. By this test Moszkowicz says it is possible to determine, in some cases, where only the toes are gangrenous, that it is safe to await the dropping off of the toe or to amputate the toes or to amputate at the root of the foot. The test is influenced by severe infections.

Wieting (1908) left both limbs bare for fifteen minutes, then covered them with bed clothes

for fifteen minutes and amputated at the level of warm skin in the diseased limb.

Delbet (1909) emphasized the fact that absence of the peripheral pulse from any cause without affecting the nutrition or vitality of the extremity means the collateral circulation is fully

Normal readings as given by Samuels (1927) follow:

Upper arm	4-20
Elbow	2-12
Wrist	1-10
Palm	0- 2

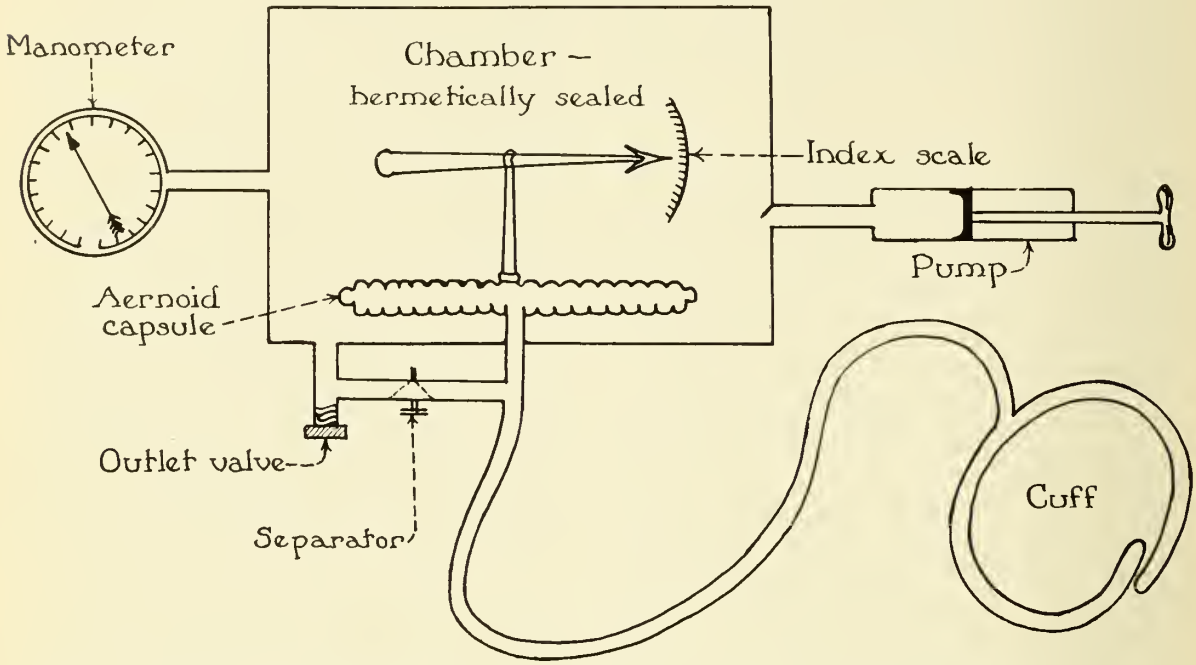


Fig. 1. Diagram of Pachon oscillometer from *Comp. rend. des sc. et mem, de la soc. de biol.*, 1909, Vol. 66.

established. This is particularly applicable to aneurism, tumors, etc.

Pachon oscillometer test (1909): In order that a capsule be constant and of maximum sensibility it is necessary that the capsule shall be without tension. The Pachon oscillometer is so constructed that there is an aëronoid capsule within an outer chamber, the capsule so arranged that the chamber and capsule are in communication and therefore under equal pressure but can be disconnected by a separator while a reading is taken. The reading is called the oscillometric index and is the number of points on the scale over which the needle passes in its excursion. To eliminate false movements due to muscular contraction the patient must be reclining and relaxed. All readings should be made at a uniform pressure for each case. They are best taken at the diastolic blood pressure. Maximum oscillations of the needle are obtained at this pressure. Toward the periphery of the extremities there is a normal decrease of the index.

Thigh	4-16
Upper third of leg	3-12
Ankle	1-10
Pedal circulation	0.5- 2

Observations by McKittrich and Root on the circulation of the legs of eighteen diabetics are given in Table No. 1.

The amplitude of oscillation theoretically reflects the amplitude of the pulse. Its change should indicate the level of occlusion in the artery.

A marked increase in the oscillometric index in cases of vasomotor spasm was observed by Babinski and Heitz (1916) after immersion of the limb in a warm bath for a period of ten minutes, but this change was not evident in true occlusive lesions. A marked increase in the oscillometric index in cases of vasomotor spasm was also observed by Oelentz and Cornil (1919) after the application of an Esmarch bandage for five

minutes, but it did not occur in organic vascular occlusion.

Physical limitations in the instrument, according to Samuels, are (1) inability to select any one vessel for study and (2) insensibility to that state of the circulation represented as lying between zero and total cessation of flow.

$$Q = \frac{H}{T - T_1} \cdot \frac{1}{S}$$

Q = Blood in grams
H = Heat given off
T = Temperature of arterial blood
T_1 = Temperature of venous blood
S = Specific heat of blood

The heat loss from the surface of the extrem-

Table No. 1.

No. of Cases	Average Oscillation				Pulsation in Dorsalis Pedis Artery		Clinical Symptoms			
	Right Leg		Left Leg							
	Above Knee	Below Knee	Above Knee	Below Knee	Present	Absent	Gangrenous	Intermittent Claudication	Ulcers	Cold Feet
Oscillations diminished										
14	3.0	0.5	3.0	0.0	5	9	5	3	3	14
Normal 4	6.5	4.0	5.0	4.0	4	0	0	0	0	4

No information regarding the extent of the collateral circulation is given by the oscillometer, therefore, one may have a living foot with a zero reading. The force and character of the cardiac contractions affect the oscillations. After following with the oscillometer for the purpose of determining the prognosis the course of 124 cases of thrombo-angiitis obliterans for periods varying from three months to four and one-half years, Silbert and Samuels (1928) concluded that when the oscillometer shows pulsation at the ankle the prognosis is good, even if ulceration or gangrene is present.

Particularly useful to determine safety of ligation of a vessel is the Tuffier and Hallion test (1912). For this test, to obstruct venous return of blood causing turgescence an elastic circular band is applied. Collateral circulation is established if this turgescence recurs after compression of the artery or arteries of the extremity. This test is not applicable where there is swelling.

Stewart (1913) described the heat elimination test. Heat produced in an extremity is negligible in comparison with that conveyed to it by the circulation. The temperature of the incoming blood is known and that of the outgoing blood is taken to be the temperature of the skin. The amount of heat given off in a known time is measured. The "volume per minute flow" can then be computed with the following formula:

ity for a given period of time was measured by Brown, Allen and Mahorner (1928) with the Stewart calorimeter as modified by Kegerreis. The loss of small calories per minute per square inch was calculated. To interpret this in terms of volume flow of blood is not possible because there are too many unknown factors to attempt a quantitative estimation of this relationship, but it is not essential. The relationship between blood flow and heat loss, however, is very close. At room temperature of 22 to 28° C. normal persons lost per minute 0.46 to 1.15 calories per square inch of body surface. In patients with thrombo-angiitis obliterans the rate of heat loss varied from 0.27 to 1.13 calories per minute for each square inch of body surface.

With a thermocouple applied to the skin Brown, Allen and Mahorner (1928) measured surface temperature at a room temperature which varied from 22 to 26° C. From the trunk to the distal areas of the hands and feet the temperature decreases. The normal temperature of the foot was found to vary between 24 and 35° C. In patients with thrombo-angiitis obliterans the temperatures were approximately the same. That skin or surface temperature per se is not, therefore, a good indication of arterial insufficiency is apparent, since the findings in both the normal and pathologic subject may be the same.

But in the skin temperature increase of the affected limbs, after administration of a foreign protein to produce vaso-dilatation, lies the essential difference. The surface temperature variations following increases in body temperature as a result of foreign protein injection give information regarding the extent of vaso-dilatation and can be employed in place of the more time consuming method of the study of the rate of heat elimination. To perform this test the body temperature and the surface temperature are determined. Foreign protein in the form of typhoid inoculation sufficient to give chills and fever (80,000,000 to 100,000,000 bacteria) is injected intravenously and changes in body temperature and surface temperature are followed. The amount of vaso-dilatation that can be produced in the collateral circulation is determined by this method.

The increase in surface temperature is 3–10° C. in normal individuals. The vasomotor index is $V_1 = \frac{ST—BT}{BT}$, where ST is the increase in surface temperature, expressed in degrees Centigrade, BT is the increase in systemic temperature, expressed in degrees Centigrade. $V_1 = 1—10$ in subjects without arterial occlusion, according to these investigators; in subjects with thrombo-angiitis obliterans it was $V_1 = 0—6.5$. Lumbar sympathectomy is not advised according to Adson and Rowntree unless V_1 is greater than 2.

A subcutaneous thermocouple was inserted (usually into the great toe) 6 mm. under the skin surface by Brooks and Jostes (1924). The temperature is determined, then a tourniquet is applied for 10 minutes. The original temperature varies widely in normal subjects but there is a uniform fall in temperature with the application of the tourniquet followed by an immediate and rapid rise after its removal. In subjects with known arterial obstruction the temperature fell during the period the tourniquet was on and following its removal the rise was delayed, the temperature continuing to fall for from two to seven minutes after removal of the tourniquet and in most cases the rise was less rapid.

The salt solution test of McClure and Aldrich (1923): From the base of the great toe up the leg at four inch intervals 0.2 c.c. of 0.8 per cent aqueous solution of sodium chloride is injected intracutaneously. Isotonic salt solution is used because it is less painful than water. This test was first used by McClure and Aldrich in normal children and those with edema of nephritis. In those with edema the time of absorption was shortened and the onset of edema could be predicted by earlier absorption. Disappearance of edema for a few days before its actual disappearance could be predicted by slower absorption. After having read the publications of McClure and Aldrich, Cohen used the test in 1925 to determine the adequacy of the arterial circulation in the extremities in cases of arterial disease associated with pain, vasomotor disturbances and even gangrene. He stresses the value of the test in giving evidence of oxygenation and nutrition of the tissues, *i.e.*, he thinks it estimates these conditions more accurately than does volume of blood flow. He demonstrated that the wheals disappear earlier immediately after ligating the single vessels of the thigh but very much more rapidly if the entire thigh had been constricted for one hour. Experience with this test in 97 cases was reported by Stern and Cohen (1926). The normal time for disappearance of the wheals was found to be approximately 60 minutes. But readings as low as 30 minutes at the base of the toe have been considered as normal. In cases with edema the test is not to be relied upon because edema regardless of the condition of the circulation causes a reduction in the absorption time. These investigators check their findings with the oscillometer.

Intra-arterial injection of sodium iodide solution was reported by Brooks (1924). He dissolved 100 grams of sodium iodide crystals in 100 c.c. of distilled water. It was sterilized and injected into the femoral artery, which had been exposed by arteriotomy. The venous flow was obstructed by a tourniquet at the thigh. Distal to a clamp on the artery a needle was inserted into the artery and 10 c.c. of sodium iodide solution injected. An *x*-ray film was made of the extremity. Because the patients had severe pain while the arteries were filled with the solution a general anesthetic was given. The pain was relieved as soon as the obstruction to the circulation was removed.

The compression test described by Allen (1929) consists of manual compression of either the ulnar or radial artery to demonstrate

occlusion of the other. With the artery compressed the patient closes his fist firmly. Pallor results after the grip is relaxed. With the artery still compressed this pallor remains if there is occlusion of the other vessel; hyperemia quickly displaces the pallor if the other artery is normal. This hyperemia gradually fades to the normal color.

DISCUSSION

Good clinical judgment must be relied upon in the final analysis. The Moszkowicz test, the skin edema test of McClure and Aldrich, and the oscillometric index may be easily determined with a minimum risk to the patient and should therefore be employed. There is some slight danger of thrombosis in the Moszkowicz test and of infection in the salt absorption test. McKittrich and Root have not found the oscillometer of great practical value except as an aid in the early diagnosis of arterial occusion. Palpation of the arteries and careful consideration of the symptoms alone is sufficient in 90 to 95 per cent of the cases according to Brown, Allen and Mahorner.

SUMMARY

1. The tests which have been proposed to test the efficiency of the circulation in arteriosclerosis, senile or diabetic, and in thrombo-angiitis obliterans are collected and briefly described.

2. The oscillometric index can be taken and the skin edema and Moszkowicz tests can be most easily performed with a minimum risk to the patient. The information obtained is of value when used to supplement the history and physical findings.

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RECURRENT LYMPHANGITIS*

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THE term, "recurrent lymphangitis," as used in this paper covers all the pathologic conditions that are known under the names, "recurrent erysipelas," "erysipeloid," "lymphedema," "elephantoid fever," and "solid edema." These terms often are used loosely. In the stricter sense, the term erysipeloid probably should be applied to and restricted to the type of erysipelas which is seen in persons who are brought into contact with hogs and other domestic animals, and which is due to the *Bacillus murisepticus*. The term, lymphedema, should be restricted to stasis of lymph as the result of mechanical obstruction; for instance, the obstruction following radical amputation of the breast without infection. The term, solid edema, is better restricted to the end process of recurrent lymphangitis in certain situations. The preceding lymphangitis may have been a process of very low grade in such cases. But in this country, the various terms are often used interchangeably, and I shall, therefore, include them in the term, recurrent lymphangitis.

Recurrent lymphangitis varies markedly in severity; it may be very mild or very severe, with all gradations between. In a typical acute attack, circumscribed areas of skin become hot, red, and swollen. The inflammation is superficial and always recurs in about the same area. The individual attack resembles closely the early stage of erysipelas, and pathologically it is erysipelas, but it differs biologically in that the areas involved are limited and that the attack lasts only a few days. Possibly the background is the development of an allergic state. The local involvement of the superficial lymphatic channels is associated with chills, often a high fever, and malaise. The satellite lymph nodes are practically always enlarged and tender. All these symptoms and signs may be minimal, and some of them may be overlooked if they are not searched for. Gradually the recurrent attacks, even those of the mildest type, lead to fibrosis with considerable thickening of the tissues, and moderate or even pronounced elephantiasis results. It should be borne in mind that very mild attacks of recurrent lymphangitis may lead to a considerable degree of elephantiasis. As time goes on the inflammatory reactions often become less pronounced, but the fibrotic changes, the stasis of lymph, and, therefore, the permanent enlargement and thickening of the involved areas increase. The end stage is permanent and occasionally leads to a grotesque appearance, or even to marked disability. The lids may become so thickened that the patient is practically unable to use his eyes; the upper lip may assume a truncated appearance; the penis may become buried in the folds of an elephentiasic enlargement of the scrotum, and the arms and legs may become so heavy that they are practically useless.

Recurrent lymphangitis is most commonly seen in the lower parts of the legs, the forearms, the eyelids, the nose, the upper lip, the prepuce and the scrotum. It is as yet a matter of surmise why it should have preference for certain anatomic regions, but clinical observation would indicate that these regions represent channels of drainage for atria that are likely to harbor infection. The nose and upper lip probably are infected by way of the nasal and paranasal sinuses and the teeth; the eyelids, through the lachrimal sac; the forearms, secondarily to trauma of the hands, and the lower parts of the legs, because of fissures between the toes, as the result of intertrigo, and particularly as the result of the universal infection with the epidermophyton. It is likely that the scrotal involvement is commonly due to scratching. On other parts of the body, I have seen the condition following vaccination on the upper part of the arm, and following old osteomyelitis of the thumb. Clinically, recurrent lymphangitis, with its subsequent changes in tissue, is sometimes distinguished with difficulty from certain forms of sarcoid, lupus erythematosus, phlebitis, and even a sclerosing syphilide. This difficulty, however, is usually obviated by a histologic examination and by

*From the Section on Dermatology and Syphilology, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Duluth, July 14 to 16, 1930.

observing the clinical behavior for a period of time. The histopathologic changes are essentially those of erysipelas, as would be expected because the process is the result of invasion of the superficial lymphatic channels by the streptococcus, and possibly occasionally by the staphylococcus. There is dilatation of the lymphatic channels associated with stasis of lymph, and pronounced infiltration with polymorphonuclear leukocytes. Later, plasma cells assemble, and definite fibrosis sets in. The seat of the plasmoma is primarily in the lymphatic channels, enclosed in the collagenous substance; the latter gradually becomes hypertrophic. This process eventually leads to the advanced changes of confirmed elephantiasis nostras.

The treatment of recurrent lymphangitis in its earlier stages is a different matter from that in the later stages, when much fibrosis has taken place. The permanent fibrotic changes probably can be removed effectually only by surgical measures, but the recurrent attacks of lymphangitis may pass through many years before any pronounced deformity has occurred. It is during the early years of inflammatory activity that the patient should have treatment to avoid permanent deformity, but it would seem that this stage is very puzzling and that the patient usually has not received any benefit from the measures employed. Fortunately, nature occasionally limits the process by the ensuing fibrosis but usually not until considerable injury to tissue has resulted. It is in the earlier stages that I have seen such gratifying results in a limited number of cases (seventeen) from the use of foreign protein given intravenously, and filtered roentgen-rays applied locally, that I am stimulated to dwell somewhat on the details of the use of these measures.

I have always given the foreign protein in the form of mixed typhoid and paratyphoid vaccine. The dosage has varied from 5,000,000 to 3,000,000,000 typhoid bacilli given at intervals of from one day to a week, and the number of doses from ten to twenty to a course. In several cases, two or three courses were given, each after an interval of several months. The variations in dosage, and so forth, were dependent on the reactivity of the patient, the severity of the process and the patient's response to treatment. Here, as in all forms of treatment, clinical judgment is necessary. The dosage of roentgen rays, of course, had to vary with the area involved and with the type of involvement. It may be recalled that the process affects chiefly the superficial lymphatic structures. This fact ought to enable any expert radiologist to give the proper dosage. Roentgenologic treatment, in this disease, as in others, should be given only by the expert. Therefore, I shall not need to dwell on the factors employed. It has been, and is, my impression that of the two methods of treatment, injection of foreign protein is the more valuable, but that is difficult to decide, for I usually combined the two. I have observed three patients who, I think, did well on foreign protein alone. I do not recall nor do the records reveal any case in which good results followed treatment by roentgen rays alone.

It is not always possible to find the atrium of infection at the time the patient presents himself for treatment of the lymphangitis. However, if it can be found, I am assuming that, in the treatment of recurrent lymphangitis, an effort should always be made to bring about healing of any atrium through which infection might gain entrance to the lymphatic structures. Lesions of epidermophyton of the feet, infected antrums and so forth, should be treated simultaneously with the lymphangitis.

CASE REPORTS

LEG LENGTHENING FOR SHORTENING DUE TO INFANTILE PARALYSIS*

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Leg lengthening for the shortening due to infantile paralysis was first attempted by Dr. Leroy Abbott, and his reports discuss fully the indications for such a procedure, in addition to showing the feasibility of the operation. Several workers since that time have devised apparatus for accomplishing the lengthening and Abbott himself has several times modified his machine. It is not the purpose of this brief communication to review what is already in the literature or to report a series of cases but merely to again call to your attention the fact that legs can be lengthened and to show the slides of some of the cases treated at the Shriners' Hospital, where satisfactory results have been obtained in paralytic shortenings by an apparatus devised and made at that institution in 1927 and used since that time. The usefulness of the operation is, of course, not confined to paralytic cases only, and shortenings due to congenital defects, injury, tuberculous hips, etc., also can be lessened or completely overcome.

The procedure is a severe one and should not be lightly undertaken, but with proper care there seems to be no reason why children with a marked difference in the length of the legs should not be given the benefit of the operation. The cases shown here all belong to the group where only the leg below the knee has been lengthened, although the thigh can also be elongated by a similar undertaking and with a modification of the apparatus. A lengthening up to 6 or 7 cm. can usually be obtained in the leg proper and this suffices in most cases. The age of the patient, within reason, does not seem to make much difference, as a given increase in length probably means just as much late in life as earlier and 5 cm. gained when 9 years of age is still 5 cm. when adult life is reached. The effect of the operation upon the growth of the bone is not yet known, of course.

The operation, which is performed under a tourniquet, consists briefly of the following steps: (1) tenotomy of the tendo achillis even if this structure is not tight; (2) transverse osteotomy of the fibula in its lower third and sometimes also in its upper third, being sure the periosteum is completely severed; (3) insertion of one modified Steinman pin in the lower end of the tibia and of two pins in the upper end, the three being in the same plane; (4) osteotomy of the tibia into proximal and distal fragments by long longitudinal cuts and two transverse cuts so that the fragments can slide on each other; (5) cutting of all tight fascial and periosteal bands possible; (6) application of the apparatus after closure and dressing of wounds.

The leg is kept at rest for eight to ten days to allow the skin wound to heal and then traction is applied to the distal pin, the two proximal pins being fixed by the apparatus. As a rule the required length can be obtained in about four weeks and when this is accomplished no further traction is attempted. Usually the

*Read as a case report at the meeting of the Minnesota Academy of Medicine, September 17, 1930.

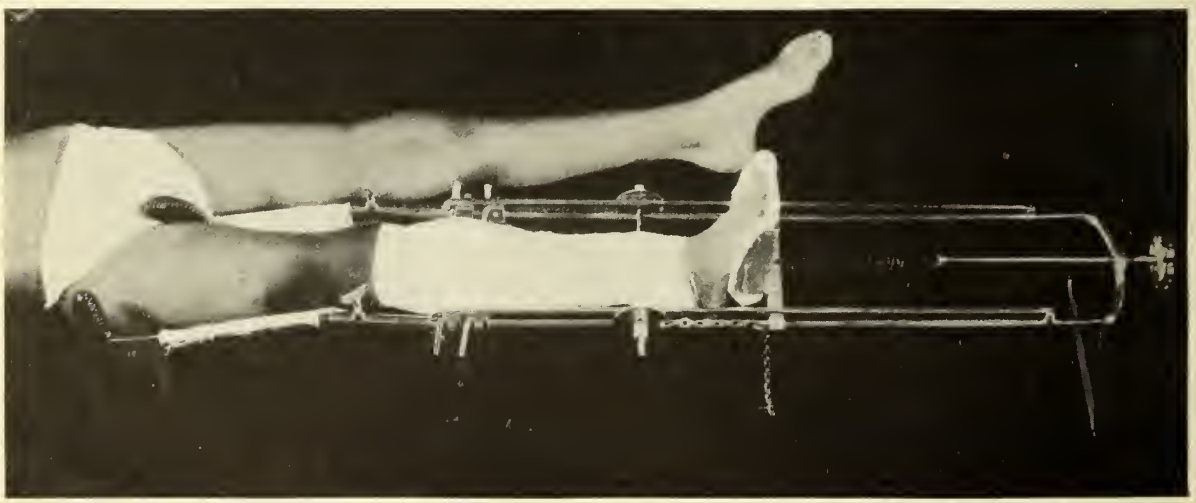


Fig. 1. Leg lengthening apparatus in use. Note the two pins in the upper fragment and one pin in the lower. The footpiece keeps the foot at a right angle, with the pull transmitted through the chains on either side to the distal pin. The centimeter scale is seen as a serrated bar. This shows in the radiographs and gives an exact reading of the lengthening obtained.



Fig. 2. *A*. Patient (No. 512) on June 22, 1927. *B*. Same patient on March 25, 1929, showing results of leg lengthening during the summer of 1927 and subastragalar arthrodesis.

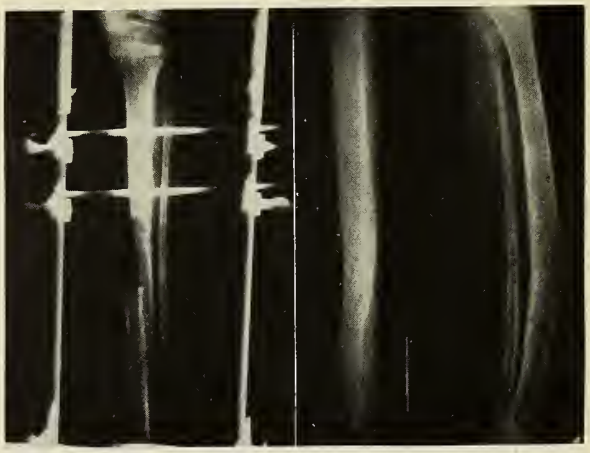


Fig. 3. *A*. Radiograph of above patient (No. 512) on August 9, 1927. *B*. Radiograph of same patient on January 3, 1930.

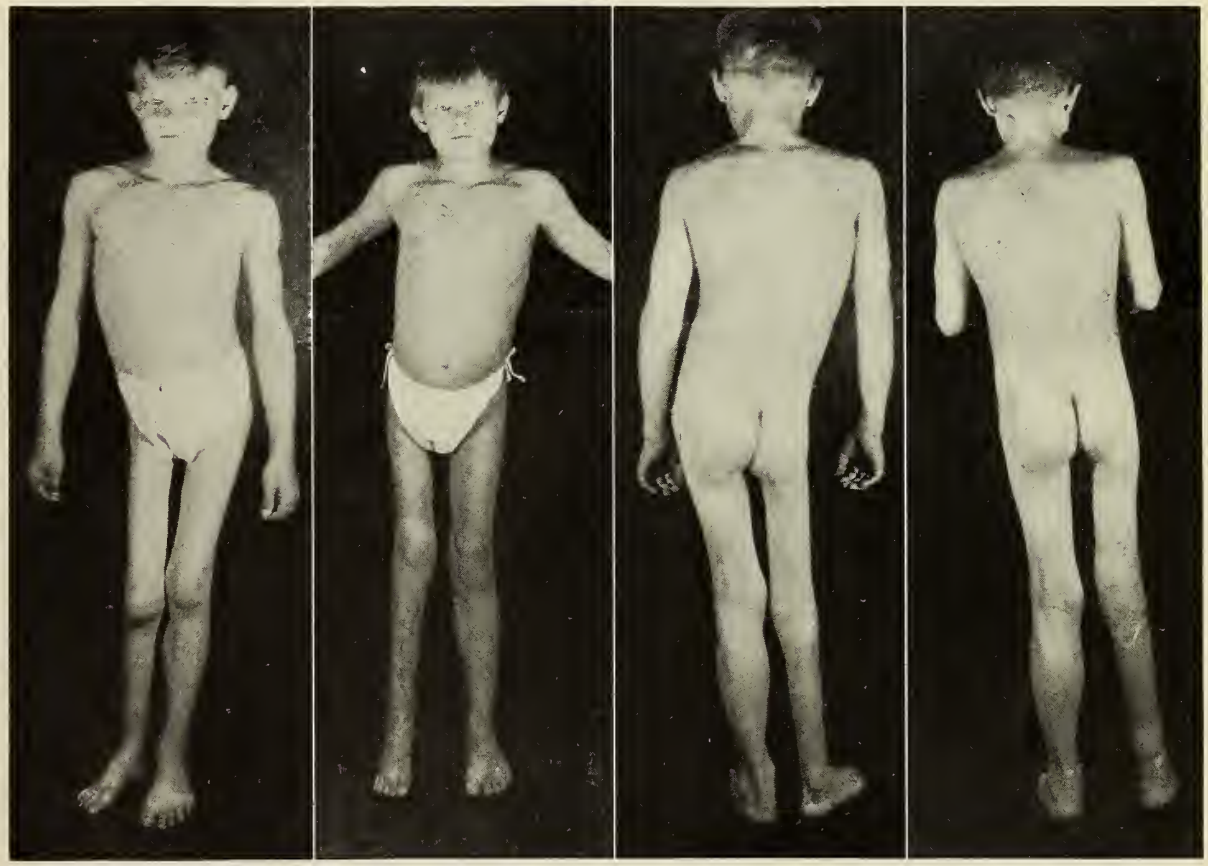


Fig. 4. *A*. Patient (No. 139) on June 26, 1928. *B*. Same patient on December 5, 1928, after leg lengthening. *C* and *D*. Same patient (No. 139), seen from behind.

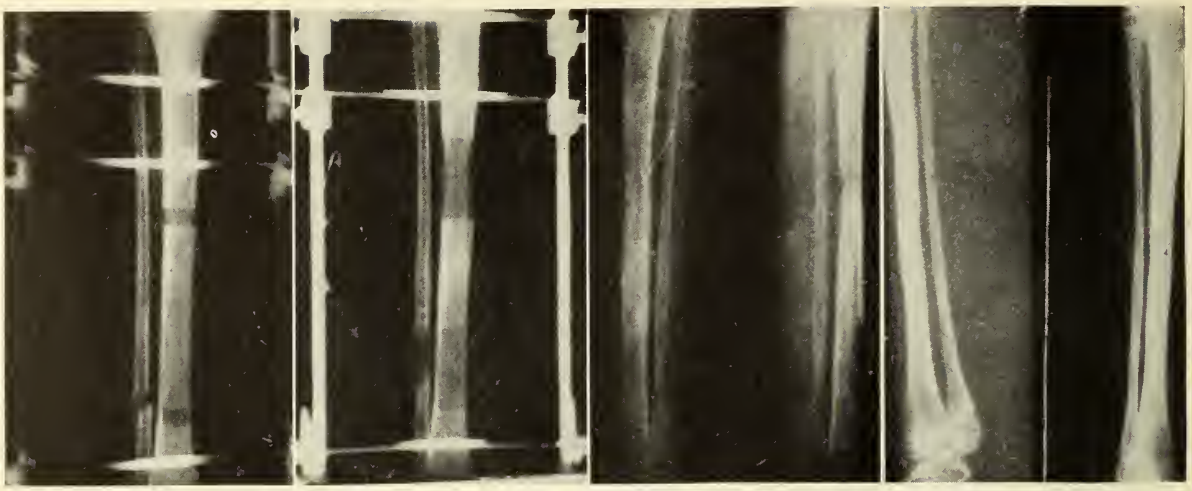


Fig. 5. *A.* Radiograph of patient (No. 139) shown in Figure 4 on August 13, 1928. *B.* Same on September 8, 1928. *C.* Same on November 29, 1928. *D.* Same on June 10, 1930.

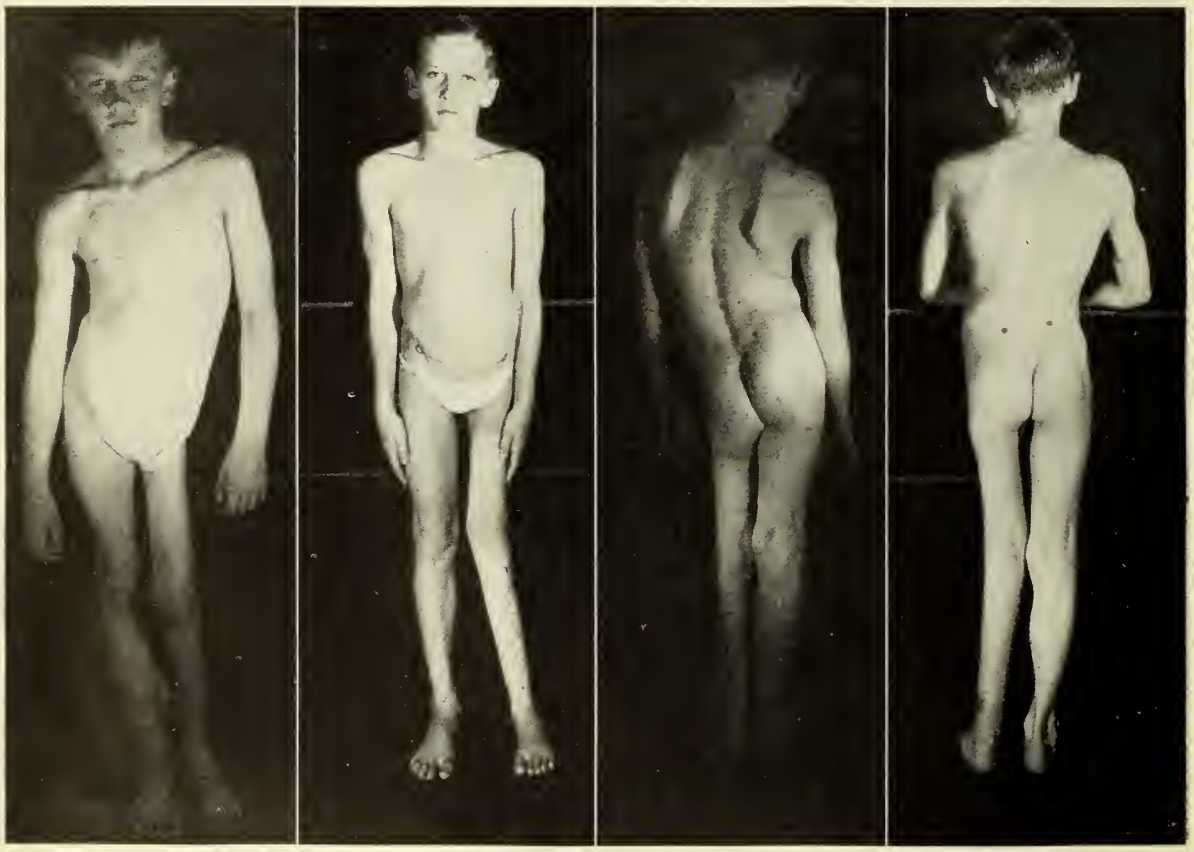


Fig. 6. *A.* Patient (No. 633) on June 5, 1929. *B.* Same patient on October 11, 1929, after leg lengthening. *C.* and *D.* Same patient (No. 633), seen from behind.

leg can be put into plaster shortly after this and supported until union is firm. A ring caliper splint will allow the patient to be up and about much sooner than otherwise.

The illustrations show the method better than any written description. (Only enough of the illustrations are here reproduced to show the character of the procedure and the end-results.)



Fig. 7. Radiograph of patient shown in Figure 6 (No. 633) taken on April 22, 1930, the leg lengthening operation having been in June, 1929.



Fig. 9. Same patient (No. 981) seen in Figure 8 wearing walking caliper to protect lengthened leg. Taken on May 24, 1930.

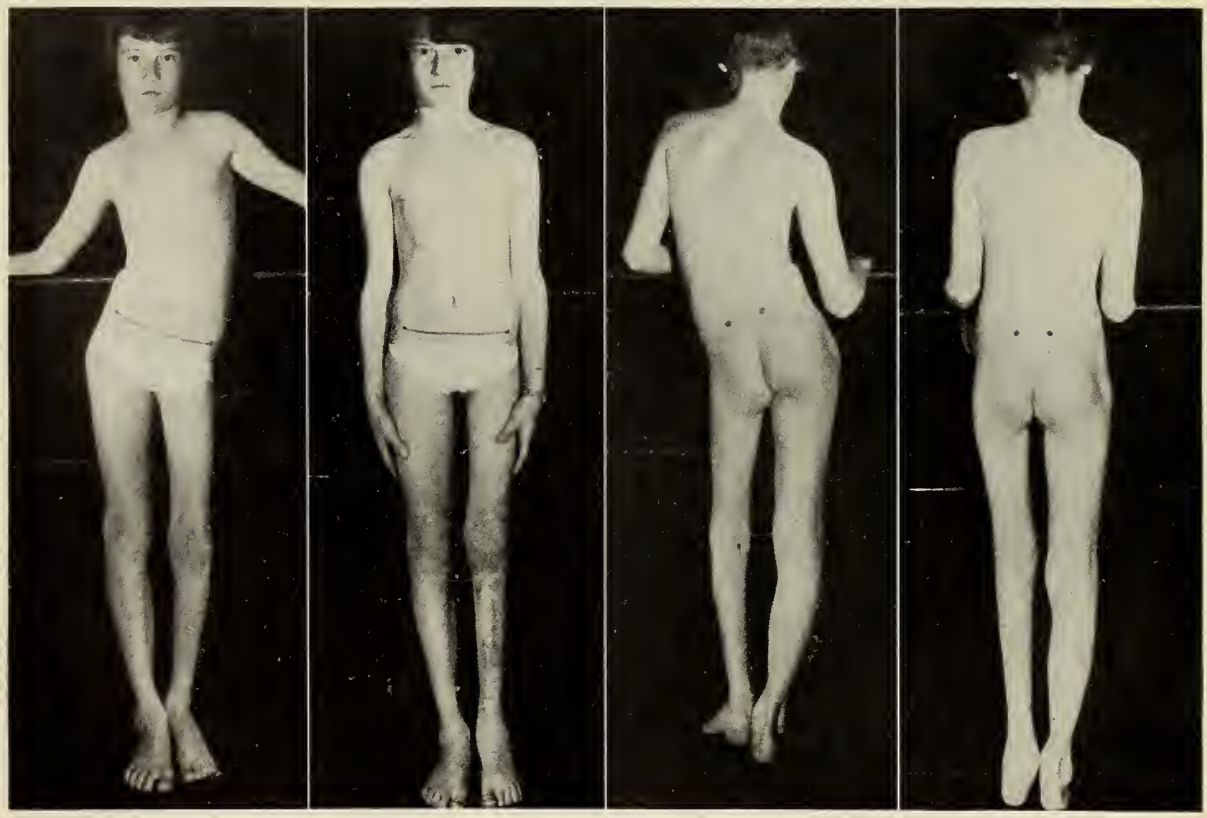


Fig. 8. *A*. Patient (No. 981) on December 5, 1929. *B*. Same patient on May 24, 1930, after leg lengthening. *C* and *D*. Same patient (No. 981) seen from behind.

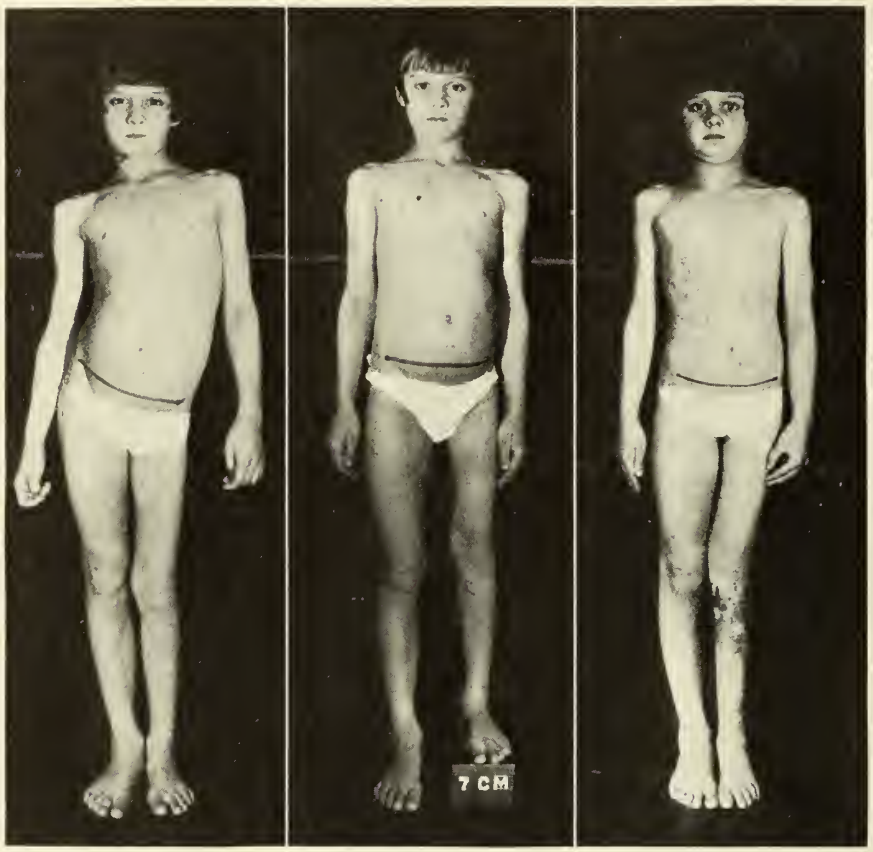


Fig. 10. *A.* Patient (No. 715) on January 7, 1930. *B.* Same patient with a 7 centimeter block under left foot to show correction of pelvic tilt. *C.* Same patient on May 24, 1930, after leg lengthening.

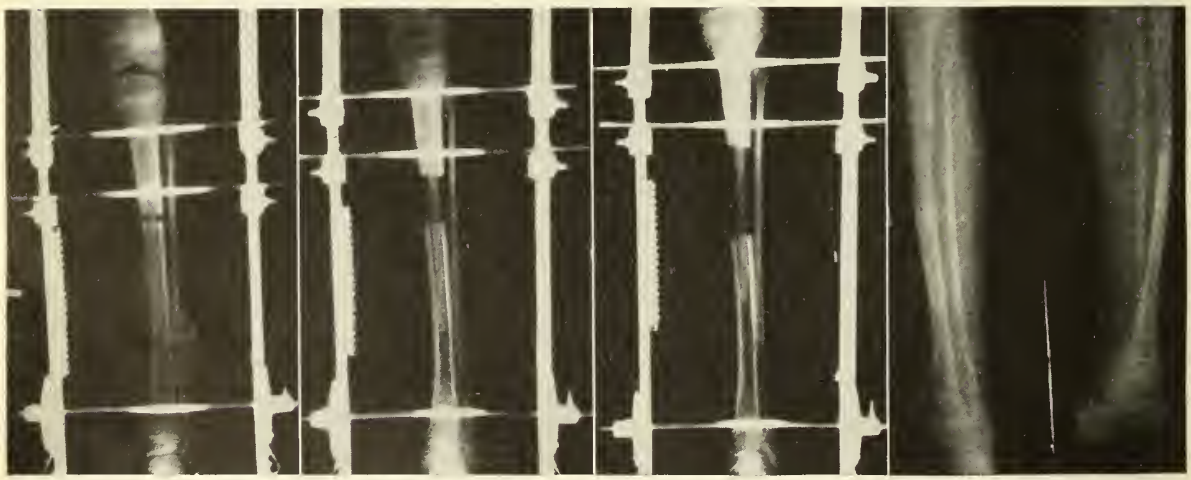


Fig. 12. *A.* Radiograph of patient shown in Figures 10 and 11 (No. 715) on January 20, 1930. *B.* Same on February 10, 1930. *C.* Same on March 2, 1930. *D.* Same on May 23, 1930.



Fig. 11. Patient shown in Figure 10 (No. 715) but seen from behind. *A*, *B* and *C* correspond to the same letters as in Figure 10.

INTESTINAL FOREIGN BODIES

REPORT OF FOUR CASES OF REMOVAL BY APPENDECTOMY OR BODY POSTURE CHANGE

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Reports of removal of swallowed foreign bodies have appeared at intervals in the literature. Four cases are herewith added to a list of ten cases reported by various authors. These foreign bodies include glass, nails, wood splinters, paper clips, hair bristle, and tablespoons. They have been swallowed accidentally in some instances, or by insane persons or professional nail and glass eaters. The majority of swallowed bodies are eliminated by the natural passages. When retained, these bodies are usually found in the stomach, the duodenum, the ileum, the cecum, or a diverticulum. Examples of various locations of foreign-body retention are given in the accompanying table. Various surgical procedures were required for the removal of the bodies from the patients listed in the tabulation.

The present report concerns the personal observation of four patients who accidentally swallowed foreign bodies and retained them in the cecum. One was removed by appendectomy and the others by changes in body posture. *Case 1.*—A. L., a male, aged 19, reported that for two or three days he had suffered pain in his right side and that two weeks before, while at work, he had accidentally swallowed a nail and wondered if that could be cause of his pain. The temperature, pulse, urine, and leukocyte count were normal and radioscopy revealed a shadow resembling a flat-headed nail in the region of the cecum. Continued observation revealed, forty-eight hours later, some rigidity of the right rectus abdominis muscle and a leukocytosis of 11,200 with tenderness over the cecum. Laparotomy was then performed. A low right rectus muscle incision was made under nitrous oxide-oxygen anesthesia at 8 a. m. April 6, 1930. The cecum was pulled up at a point where radioscopy indicated the nail shadow. An area of hemorrhagic discoloration was present on the outer side of the cecum and about four or five inches above the ileocecal valve. The nail could be palpated at this site and its point was demonstrated, by manipulation, to be fixed in the wall of the cecum. The sharp end of the nail was backed out and moved with the aid of Lockwood forceps, head first, down the bowel lumen to the appendix vermiformis, into which it was "milked" point forward. Appendectomy was then performed and the nail with the appendix was removed. The accompanying illustration shows the nail as found in a fold of mucosa of the cecum at "A" and also as moved into the appendix vermiformis at "B" ready for re-

moval by appendectomy. Recovery was uneventful and the patient left the hospital April 17, eleven days after operation. The pathologist's report follows: "Specimen of appendix vermiformis, 0.9 by 7 cm. Serosa has tags of fibrous tissues attached, otherwise is without evidence of inflammatory change. A steel nail is present

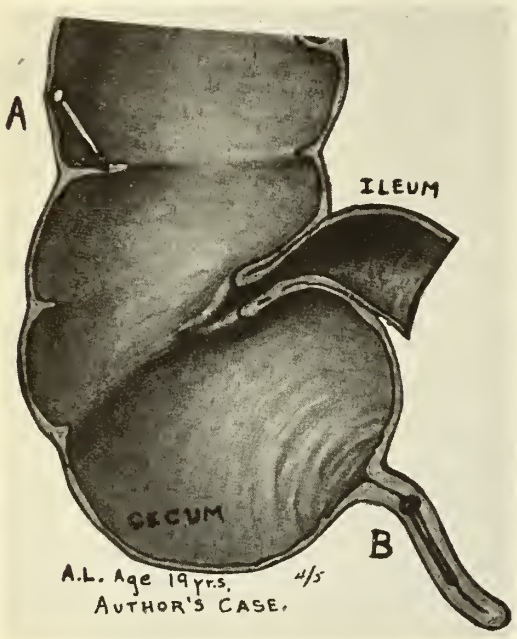


Fig. 1. Drawing shows the nail partially perforating the bowel wall at *A* and also in the lumen of the appendix vermiformis at *B* into which it was "milked" for removal by appendectomy.

in the lumen. Its surface is black but smooth. The nail is 3.5 cm. long, about 2 mm. in diameter and the head is 5 mm. in diameter.

Cases 2, 3, and 4.—These three boys (J. B., aged 12; A. S., aged 6, and T. F., aged 7) though seen months apart, had accidentally swallowed a steel ball from an automobile bearing, which had been used in playing marbles. All steel balls were about one-half inch in diameter. In each patient the steel ball remained in the caput coli and removal was accomplished without surgery. After thoroughly emptying the large bowel, the patient was placed upon the radioscopic table in the Trendelenburg position and, by shaking his body, the steel ball was made to roll to the hepatic flexure in the colon and from there through the transverse colon. All during this process, the progress of the foreign body was observed under the fluoroscope. When the patient stood up, gravity carried the metal ball to the anus, through which it was expelled.

TABULATION OF PREVIOUS CASE REPORTS

1. Several nails and pieces of glass removed from the stomach and ileum of a professional nail swallower. Stewart, J. C.: Jour. Am. Med. Assn. 48:2028, 1907.
2. A wooden splinter accidentally swallowed by a four year old boy removed from the ileum. Spence, T. B.: Long Island Med. Jour. 2:65, 1908.
3. A stiff hair bristle accidentally swallowed by a seventeen year old girl removed from the appendix. Spence, T. B.: Long Island Med. Jour., 2:65, 1908.
4. A wire paper clip taken with suicidal intent by a thirty-five year old insane woman removed from the ileum. Ross, G. G.: Ann. Surg., 63:247, 1916.
5. A piece of glass accidentally swallowed, perforated Meckel's diverticulum, producing an umbilical abscess in a five year old boy. Kilgore, F. H.: Med. Rec. and Ann., 17:125, 1923.
6. A wooden toothpick, accidentally swallowed, removed from the cecum of an adult. Ross, G. G.: New York Med. Jour., 86:880, 1907.
7. A steel nail, accidentally swallowed, removed from the duodenum of a twenty-three year old man. Mairane, M.: Adch. Ital. di Chir., 7:502, 1923.
8. A hairpin, swallowed with suicidal attempt, removed from the duodenum and gallbladder of a thirty-one year old prisoner. Arch. f. Klin. Chir., 128:437, 1924.
9. A pin, accidentally swallowed removed from the duodenum. McCartney, F. M.: Denver Med. Times, 27:359, 1907-08.
10. Several teaspoons removed from the stomach of a twenty-nine year old insane woman. Balfour, D. C.: Jour. Am. Med. Assn., 66:421, 1916.

URETERAL STONE WITH PERIURETERAL EXTRAVASATION

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We have not been able to discover in the literature any recorded cases of non-traumatic ulceration or perforation of the ureter. Young and Waters* have shown two radiographs of extravasation of the pyelographic medium into the retroperitoneal space, but both of these cases are the result of puncture of the ureter by the ureteral catheter. The case which we report herein shows extravasation of the medium into the retroperitoneal space through an opening in the wall of the ureter caused by a sharp calculus.

The essential points in the history are as follows:

H. M., a male, aged 58, was seen by Dr. S. H. Boyer, and admitted to St. Luke's Hospital September 12, 1930, complaining of knife-like pain in the left side of the abdomen. His first attack came on three weeks preceding admission and lasted one and one-half hours. Since that time he had had difficulty in starting urination. He complained also of frequency and burning. These symptoms occurred only at night, although he was unable to tell at any time whether or not the bladder was completely empty. Eight days preceding admission he had a recurrence of the pain and it had continued intermittently ever since. There was no evidence of hematuria or cloudy urine.

Physical examination was essentially negative except

*Young and Waters: Urological Roentgenology, pages 357 and 363.

that the teeth were poor, showed pyorrhea and had many fillings. The left lower abdomen was rigid and tender, especially in the left iliac region. The left flank was tender and spastic. The lumbar muscles on the left side were prominent, spastic and very tender to deep percussion.



Fig. 1



Fig. 2



Fig. 3

On admission the temperature was 98.6, pulse 86, respiration 18. Urine showed a trace of albumin, an occasional leukocyte and many erythrocytes. The red blood cell count was 4,300,000 and the white count was 12,100. Blood urea was 18.9 mgs. and creatinin 1.8 mgs. Stereo-roentgenographs of the abdomen showed a small opaque area about 8 x 4 mm. situated in the path of the left ureter just opposite the upper border of the fourth lumbar body. It was diagnosed as probably a ureteral stone (Fig. 1).

On ureteral catheterization the pyelogram showed the same opacity lying just beside the catheter in the same relative position. Urine from the right kidney was clear and showed microscopically an occasional epithelial cell with one or two erythrocytes per high power field. Urine from the left kidney was clear and showed a few leukocytes with twenty-five to forty erythrocytes per high power field. The pyelogram (Fig. 2) showed no change in the position of the stone, negative calices, and negative kidney pelvis. There was some extravasation of the filling medium into the retroperitoneal space extending in a diffuse cloud from the kidney pelvis to the crest of the ilium. It seemed improbable that the kidney could be so large and still not show some deformity of the calices, especially in the lower pole. The arrangement of the shadows caused by the medium was such as is often seen in infiltration into soft tissue and not into one well defined cavity. The filling medium was withdrawn from the kidney pelvis immediately after the pyelogram was made. The film (Fig. 3) was taken fifteen minutes after Fig. 2, and showed the kidney pelvis practically empty.

At operation the stone (Fig. 4) was removed from the ureter. There was evidence of light, crisp adhesions from inflammation in the neighborhood of the left kidney and ureter. These adhesions were easily separated. The kidney was apparently normal. The ureter was slightly thickened and there was induration of the tissues around it. The stone was located in the ureter

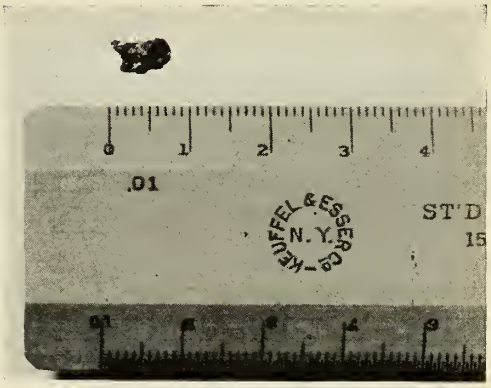


Fig. 4

about 7 cm. below the junction of the kidney pelvis and ureter. It was removed through a small incision in the ureter. The incision in the flank was closed with drainage.

SUMMARY

The pyelograms show the ureteral catheter in the kidney pelvis. The kidney pelvis was well filled with opaque medium, the catheter entered the ureter easily, the extravasation occurred around the ureter at the point where the stone was located. Suction through the catheter removed the filling medium from the kidney pelvis but not from around the ureter. The stone was not displaced by manipulation. It had a sharp point which could have penetrated the ureteral wall. The surrounding tissues at operation showed evidence of inflammation indicating an extravasation from the ureter.

President's Letter

IT IS frequently stated, especially by social writers and the press, that the medical code of ethics is outworn, obsolete and absurd. Leaving the reasons for so thinking out of consideration one is none the less moved to wonder just what is meant by the term medical ethics.

The terms ethics and morals are of very similar, if not precisely the same meaning. The former term derives from the Greek and means right conduct; the word morals is from the Latin and likewise means right conduct. Thus we may conclude that ethics concerns itself with the rightness and wrongness of things, decency as against indecency, the moralities and the immoralities. We must not confuse the social amenities, the conventions and mere etiquette, with ethics. These latter are but a polish, very pleasing to encounter and well calculated to grace social intercourse, but superficial withal. They may connote the cultured gentleman or but cloak the true character of a most unethical, immoral or unmoral scamp. Ethics is the product of character. Character determines conduct. Conduct may bespeak character but it does not make it.

No one of character needs to be told what constitutes honor and decency and fair dealing between individuals. Such a person knows these things instinctively. It is rather the broader aspects and applications of ethics that challenge our understanding. From time immemorial the ethical relation between physician and patient has been that of placing the patient's feelings, interests and physical welfare above everything else; an accepted rule of conduct that at times calls for no small degree of self abnegation, and when faithfully followed by physicians is found to eliminate personal differences between them and establish bonds of confidence and friendship. Such practice can never be obsolete nor absurd.

Our ethical relations to the public and our duty to ourselves are indeed puzzling at the present time, and this applies not alone to the medical profession but to practically all other callings. Social conditions are forever changing and that means adaptive ethical changes also. The latter sometimes lag but they will always come, just so long as fineness of character exists. Our critics might do well to note the difficulties existing in their own fields of endeavor before telling the medical profession how to correct theirs.

Advance in knowledge and industry has resulted in tremendous social changes accompanied by a general consciousness of the desirability of what is called social service. This is the point at which our ethical uncertainties begin. The whole-time clinical teaching in our medical schools, public health nursing, social service nursing, health centers, public health education, preventive medicine both lay and official, the free and the pay clinic, compulsory industrial insurance, actual curative and corrective medicine practiced by the state and a host of similar changes and allied movements have wholly changed the face of the practice of medicine. The changes compel adaptive changes in medical ethics.

How we shall meet these changes with moral integrity is our problem. No one man, no group of men, can at this time effect a solution out of hand. All through the variations of the present and the future the great thing that concerns us as doctors, and also the public, is the preservation of a united well organized profession, high ideals, a never failing opportunity for professional advancement, and of financial reward commensurate with the value of professional attainments and of services rendered.

The holiday season is at hand and your retiring president takes pleasure in offering your succeeding one every felicitation and such aid as he may desire; in hoping that we may gradually find our way out of the maze in which we find ourselves today; in extending to all the seasons greetings, a Merry Christmas and a Glad New Year.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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THE ANTI-VIVISECTION BILL

Again the subject of vivisection. For many years the anti-vivisectionists have been striving to prohibit vivisection by legislation. Some forty bills have been presented to Congress during this period but never until now have they been able to get a committee recommendation of a bill, the previous bills having died in committee. So vigorous and persistent have their efforts been that finally they have succeeded in obtaining recommendation by the committee of the house, of a bill to prohibit experimentation on dogs in the District of Columbia. The cleverness of limiting the proposed law to the use of the dog is an appeal to the emotional nature of man, for the dog has always been man's particular pet. It is obvious that the enactment of this proposed bill would serve as a powerful entering wedge for the extension of similar legislation throughout the states of the union.

The question of the advisability of such a law should be approached from a common sense viewpoint and emotionalism should not be given too much consideration.

Have experiments on dogs added anything to the alleviation of human suffering and to the prolongation of human life? If so, there should be considerable hesitation before prohibitive legislation is enacted. Experiments on dogs were responsible for two outstanding triumphs in the field of therapeutics in recent years. The development of insulin in the treatment of diabetes and the discovery of the value of liver and liver extracts in pernicious anemia were the result of work done chiefly on dogs. Both remedies have relieved the symptoms and have prolonged the lives of thousands of human beings afflicted with these diseases. The results in these two instances alone have added much to the justification of vivisection. Mention might be made of the work that is being done in the prevention of distemper in dogs which promises to be effective. How will any method be evolved to prevent this disease which has proven to be such a scourge to the canine species in particular, if all experimentation on dogs is prohibited?

That needless animal experimentation is performed is admitted. That needless cruelty to animals has at times accompanied animal experiments is also admitted only to be severely condemned. We have, however, the word of Dr. Carlson, the eminent physiologist of Chicago, who is posted on the facts in the case, that such instances amount to only a fraction of one per cent of all experiments conducted. Doctors are similar in certain respects to any other group of mortals and among them are numbered a few who are lacking in human compassion.

A grave responsibility rests in the hands of those who supervise animal experimentation in the medical schools and research laboratories.

Experiments should be limited to problems which offer some chance of adding to the sum total of scientific knowledge and then anesthesia should be used.

Needless legislation of the sort mentioned will only put more useless and senseless laws on the statute books. Such procedure is as illogical as amputating an arm to cure a sore finger and will greatly curtail research which is so urgently needed to discover new remedies for the many human ailments in the treatment of which our hands are at present tied.

The logical solution of the problem—and there is a certain problem involved—is regulation of vivisection. Individuals and scientific institutions might well be given permits before they are allowed to carry on animal experiments of any sort, not merely on dogs, and a certain supervision conducted by a branch of the national government.

If the anti-vivisectionists were logical—which they are not—they would direct some of their energy against hunters and trappers. Some of the methods of the latter are notoriously cruel. Certainly anti-vivisectionists should not wear furs and logically should be strict vegetarians. This group includes some well-meaning sentimentalists and not a few men and women of means. They have resorted to emotionalism and, we regret to state, even misrepresentation in fighting fanatically for their ends, which, if attained, will result in grievously curtailing medical progress.

The present bill known as the Zohlman Bill (House No. 7884; Senate No. 4497) will be submitted to Congress, which convenes the first of this month, and will probably not come to vote until about February 1. Physicians realize the importance of defeating such a proposal. Every effort should be made to inform our congressmen of the true facts in the case.

WOMEN'S STATE AUXILIARY

The Women's Auxiliary of the Minnesota State Medical Association was one of the first auxiliaries to be founded. The question of the advisability of starting an auxiliary in Minnesota was fully discussed previous to its organization and the step was taken with the approval of the State Medical Association.

While the members of an auxiliary have few common interests compared to those of a medical society, an active auxiliary can undertake certain well worth-while activities.

Perhaps one of the most important functions of a medical auxiliary is the entertainment of visiting women at the time of medical conventions. This applies, of course, to the units in the larger cities, and the entertainment of the visiting women at the recent International Assembly in Minneapolis is a case in point.

Fully as important a function is the opportunity an auxiliary has for disseminating facts about medicine through its contact with various women's organizations. We are inclined to shut our eyes to the importance of using every channel possible to counteract the vigorous and often malicious propaganda being foisted upon the public by anti-vivisectionists, anti-vaccinationists and similarly minded individuals. The false reasoning and illogical conclusions reached by certain well-meaning, but perhaps often fanatical individuals is certainly in opposition to sane medical progress and detrimental to the public welfare. Continuous, not spasmodic effort to inform the public through every possible agency must be made to counteract the various anti's who seem to be tireless in their energy.

Legislative activities are mentioned as one of the functions of an auxiliary. Lobbying is out of the sphere of women, but members of an auxiliary can be informed as to choice of legislators and can disseminate such information.

We approve the aims of the Women's Auxiliary of the State Medical Association which are enumerated in this issue of the journal, and we offer our assistance in every way possible to further their objectives and make the auxiliary column of interest to members of their organization.

HISTORY COMMITTEE

We have long since returned from our vacation and find our editor has used up the material we furnished him a year ago.

On February last we read in the papers that the Italian Consul in New York wanted a New York barber arrested because he looked and dressed like Mussolini, and the Duce didn't like it. That reminded us that a St. Paul physician was arrested in Switzerland in 1854 as it was supposed that he was Joseph Mazinni, the Italian patriot. He told the Swiss police he was an American physician, so to test him his inquisitors

asked him about yellow fever. When he told them he had never seen a case, they were doubly sure he was an impostor, "as is not yellow fever an American disease?" Of course, in those days to most Europeans America was all alike from Argentina to Quebec. At any rate, he got out of jail after ten days in a small cell on a bread and water diet.

We find these "old Docs" interesting men in many ways. Let Dr. H. M. Workman at Tracy know what medical men lived in your town in the early days and what you know about them.

J. M. A.

NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

LEDERLE LABORATORIES, INC.

Diphtheria Toxoid

MALTINE COMPANY

Maltine with Cod Liver Oil and Iron Iodide

Amytal.—Isoamylethylbarbituric acid.—Amytal differs from barbital (diethylbarbituric acid) in that one of the ethyl groups of barbital is replaced by an isoamyl group. The actions and uses of Amytal resemble those of barbital. It is proposed as a sedative and hypnotic in the control of insomnia and as a preliminary to surgical anesthesia. Amytal is also supplied in tablets containing 1½ grains. Amytal can be used before local or general anesthesia safely only by those who have had much experience and are familiar with the literature concerning such use. Eli Lilly & Co., Indianapolis.

Pulvules Sodium Amytal, 3 Grains.—Gelatin capsules ("pulvules") each containing 0.2 Gm. (3 grains) of sodium amytal, the monosodium salt of isoamylethylbarbituric acid. The actions and uses of Pulvules Sodium Amytal, 3 grains, resemble those of barbital. The product is proposed as a sedative and hypnotic in the control of insomnia and as a preliminary to surgical anesthesia. Pulvules Sodium Amytal, 3 grains, can be used before local or general anesthesia safely only by those who have had much experience and are familiar with the literature concerning such use. The pulvules may be administered by mouth or rectally. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., October 18, 1930, p. 1178.)

Ampules Emulsion Mesurol, 20 per cent, 1 c.c.—A suspension of mesurol (New and Non-official Remedies, 1930, p. 100) in sesame oil, each cubic centimeter of which contains mesurol equivalent to from 0.103 to 0.117 Gm. of bismuth. Winthrop Chemical Co., Inc., New York.

Tablets Theocin 1 1/2 grains.—Each tablet contains theocin (New and Non-official Remedies, 1930, p. 415), 1½ grains. Winthrop Chemical Co., Inc., New York.

Ampules Mercurochrome-H. W. & D., 1%, 10 c.c.—An aqueous 1 per cent solution of mercurochrome-220 soluble (New and Non-official Remedies, 1930, p. 271) stabilized with ammonium hydroxide; in 10 c.c. ampules. G. D. Searle & Co., Inc., Chicago.

Ampules Mercurochrome-H. W. & D., 1%, 20 c.c.—An aqueous 1 per cent solution of mercurochrome-220 soluble (New and Non-official Remedies, 1930, p. 271), stabilized with ammonium hydroxide; in 20 c.c. ampules. G. D. Searle & Co., Inc., Chicago. (Jour. A. M. A., August 2, 1930, p. 343.)

Diphtheria Toxoid-Cutter.—Diphtheria Toxoid-Cutter (New and Non-official Remedies, 1930, p. 485) is also marketed in packages of one 45 c.c. vial. Cutter Laboratory, Berkeley, Calif.

Synthetic Thyroxine.—It contains not less than 65 per cent of iodine. It has the actions and uses of thyroxin, U. S. P. (New and Non-official Remedies, 1930, p. 403). Synthetic thyroxine is supplied in the form of ampules containing 1.1 c.c. of solution containing 1 mg., and in the form of a solution, each c.c. containing 2 mg., and in tablets containing 1 mg. Hoffmann-La Roche, Inc., Nutley, N. J. (Jour. A. M. A., August 16, 1930, p. 485.)

Antimeningococcic Serum.—Antimeningococcic serum (New and Non-official Remedies, 1930, p. 350) marketed in packages of two 15 c.c. syringes with apparatus for intraspinal injection; in packages of one 50 c.c. double-ended vial with apparatus for intraspinal injection. National Drug Co., Philadelphia.

Mercurochrome Suppository-Aces. — Suppositories representing a 2 per cent solution of mercurochrome-220 soluble (New and Non-official Remedies, 1930, p. 271) in a slightly aromatized, hydroglycero-gelatin base; each suppository weighs approximately 6.5 Gm. (100 grains). Aces Laboratory, Inc., Brooklyn, N. Y. (Jour. A. M. A., August 23, 1930, p. 594.)

White's Cod Liver Oil Concentrate.—A cod liver oil concentrate in the form of tablets (wafers), each containing not less than 250 Vitamin A units and not less than 100 Vitamin D units. White's cod liver oil concentrate possesses properties similar to those of cod liver oil so far as these depend on the fat-soluble vitamin content of the latter. White Laboratories, Inc., Gloucester, Mass. (Jour. A. M. A., August 30, 1930, p. 663.)

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Argo Corn Starch (Corn Products Refining Co., New York). A refined corn starch of high purity. It contains 86.95 per cent of starch. It yields 3.50 calories per Gm. (99.4 per ounce). Argo Corn Starch is proposed for use in puddings, custards, ice cream, a wide variety of desserts, in bakery products, and for thickening gravies, sauces, pie filling, stewed fruits, etc.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

One of the cornerstones of lay security and trust in the medical profession lies in the fact that the doctor never refuses to come when and where he is needed.

Is it premature labor or the croup or a night of terror? The telephone will bring expert medical help yet—in Minnesota. Such reliance is one of the glories of medical practise earned by untold labor and hardship and not to be surrendered easily so long as the doctor wishes to remain what he has been, the trusted friend, and not the irresponsible hired employee.

But who knows what is to happen to this phase of the traditional practise of medicine if the dangerous state of affairs that exists these days in some of the large centers should spread? The profession in Minnesota has much to be thankful for that it is in Minnesota and not in Chicago or Detroit judging by an editorial appearing recently in the Wayne County (Detroit) bulletin on the subject of "Fake Calls and Badger Games."

The editorial follows:

The profession views with alarm the increase in fake calls made either for the purpose of the robbery or kidnapping of physicians, or the malicious application of the "badger game" to them.

Time was when the physician could go about his duties at any time of the day or night without giving a thought to the possibility of interference of any sort. The respect for his profession, and the personal sacrifices that are entailed in its practice seemed to render him immune as prey for the kidnaper, blackmailer or hold-up man. That time, unfortunately, is no more and it is now necessary to warn physicians repeatedly of the dangers attendant upon calling on those about whom they know nothing.

A few recent happenings will serve to illustrate some of these dangers. The first is the kidnaping of Dr. Frank L. McPhail of this city when he responded to the call of a supposed patient. Next is the "enraged husband" act reported from New York City, which is put over on doctors who have responded to the call of a "sick" woman alone in a hotel room where the irate husband rushes in as the doctor is about to make an examination; and finally there is the accusation of assault made by a female narcotic addict against the physician who refuses to administer morphine. All of these incidents and many more like them are serving to make physicians exceedingly wary and while no restraint has been or ever will be placed on the exercise of the doctor's judgment in deciding on whom to call or not to call, the time is rapidly approaching when the taking of chances will be reduced to a minimum by the men themselves.

It is regrettable that such a state of affairs exists for it works a hardship on those who have legitimate need for the services of a physician, yet nothing can be done about it since the risks involved make the refusal to call anywhere at any time thoroughly justifiable.

OF GENERAL INTEREST

Dr. L. T. Sussex of Rochester, Minnesota, is now located in Havre, Montana.

Dr. Edward Waldemar Anderson, formerly of the Mayo Clinic, Rochester, is now living in Hanover, New Hampshire.

Dr. E. E. Kidder has moved from Hibbing, where he was a member of the staff of Rood Hospital, to Stevens Point, Wisconsin.

Dr. Ralph Garfield Mills, formerly of Rochester, Minnesota, is now associated with the Wiley-Smith Clinic, Fond du Lac, Wisconsin.

Dr. Emil Geist, Minneapolis, returned on Friday, October 24, 1930, with Mrs. Geist, from Paris, where he has been attending the meeting of the International Orthopedic Society.

The publication of the November issue of MINNESOTA MEDICINE was considerably delayed on account of the moving of the printing plant from 2429 University Avenue to 2642 University Avenue, Saint Paul.

Dr. F. C. Rodda, Minneapolis, addressed the Scott-Carver County Medical Society at Montgomery, November 11, on Pediatrics. Dr. W. A. Fansler, also of Minneapolis, talked on Hemorrhoids. Dr. Thomas P. Martin of Arlington was elected to membership in the society.

J. A. Myers of Minneapolis addressed the following societies during the month of November: McLean County Medical Society in Bloomington, Illinois, on November 6, and Illinois Tuberculosis Association in Jacksonville, Illinois, on November 7; the Iowa Tuberculosis Association, the Iowa Pediatric Association, the Des Moines Academy of Medicine and the Polk County Medical Society, all of Des Moines, on November 14.

Following his return from Philadelphia, Pennsylvania, where he did two years' post-graduate work in surgery at the University of Pennsylvania Post Graduate Medical School, Dr. Brand O. Leopard has formed an association with Dr. W. B. Richards, whose practice is limited to pediatrics and obstetrics, and has opened offices with him at 306 Granite Exchange Building, Saint Cloud, Minnesota, for the practice of surgery and general medicine.

On October 6, 1930, at a dinner meeting of the Medical Assembly, a recently organized group of younger physicians in Saint Paul representing the specialties, the following officers for the year were installed: Gordon R. Kamman, president; Richard B. Hullsiek, vice president; James J. Swendson, secretary-treasurer. Drs. Joseph E. Borg and Richard B. Hullsiek addressed the society on "The Use of Potassium Sulphocyanate in Hypertension" and "Hematuria as a Symptom."

A banquet was tendered Dr. L. L. Sogge on November 14, 1930, in honor or his election to the presidency of the Minnesota State Medical Association. The banquet, graced by Dr. A. G. Chadbourn as toastmaster, was held at Memorial Hall, Fulda, Minnesota, and was attended by some seventy doctors and their wives. The dinner was served by members of the local auxiliary, and vocal and cello solos were given by Mrs. Engh and Mrs. Stratte. Dr. S. H. Boyer, retiring president of the association, spoke on "The Significance of State Medicine." Dr. H. M. Workman spoke on the work and personnel of the State Association and Dr. H. M. Johnson of Dawson explained some of this work being done by the association. Mr. F. M. Brist, attorney for the State Board of Medical Examiners, spoke on the Basic Science law and the recent suit which established its constitutionality. Dr. F. H. Aldrich of Belview rehearsed some of the activities of the Legislative Committee and greetings were brought from Iowa by Dr. Hoff of Sibley.

The 1930 Christmas Seal sale serves to call attention to certain important late developments in our knowledge of tuberculosis. The most interesting of these is probably our newer knowledge of the significance and character of childhood tuberculosis, upon which the campaign for the sale of Seals is laying particular stress this year.

Emphasis in the tuberculosis campaign now has turned to the detection of the childhood type of the disease. Such detection depends, in its turn, upon widespread, well directed public education as well as upon the doctor in his private practice.

It has always been the principal work of the Christmas Seal organization to carry on the education of the public in the latest methods of control of tuberculosis. It has carried on the campaigns of education by means of literature, lectures, newspapers, magazines, and demonstrations of needed activities, and in all these activities it has the hearty interest and cooperation of the medical profession in this state.

There is a unique coalition in Minnesota between the organized medical profession and the Christmas Seal organization. As a result, the health information broadcast under public health association auspices is medically supervised, authentic, proper, and designed to serve the best interests of both public and physician. This fruitful coöperation has provided important and valuable short courses in tuberculosis for the physician, the latest held recently at the state sanatorium at Ah-Gwah-Ching. These, too, were financed by Christmas Seal funds.

The Christmas Seal campaign deserves the wholehearted support of the medical profession and throughout the state physicians are taking an active part in both the fund raising and educational phases of the campaign.

Tuberculosis, despite the fact that the death rate for all age groups has been cut in half, still ranks first as a cause of death in that important age group from fifteen to forty-five years.

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I want to get your advice as to treatment in the following case: A married woman, age 30, whose past history is essentially negative, developed an acute bilateral iritis; about a week after this attack pain developed in the dorsum of her left foot. The pain was very severe but there was very little swelling. During the next three days the right knee joint became involved. This was soon followed by the left knee joint, and indefinite involvement of both wrist joints. It is now a little over three weeks since the foot became involved. The swelling of the joints has practically subsided but she is still having unbearable pains in her right knee and left foot. I have tried to immobilize the knee by putting the leg in a splint but was unsuccessful in relieving her pains except for a very short time. Salicylates were pushed with no apparent relief. Her iritis has shown some improvement with constant recurrences. Now the question arises whether I would be justified in using typhoid vaccine (foreign protein) intravenously. Should the vaccine be diluted before giving it by the intravenous route? What other form of treatment would be of benefit in this case?

Answer.—1. Atropine, one per cent, in each eye, sufficient to keep them properly dilated; smoked glasses to be worn in bright light, and intermittent hot packs. Sodium salicylate, available in ampules containing 15½ grains in solution, should be given intravenously, one ampule at intervals of five days until improvement sets in. If this does not bring about sufficiently speedy results, foreign proteins in the form of typhoid-paratyphoid a and b can be used intravenously, beginning with a dosage of ⅓ minim in 2 c.c. of sterile water. For this the patient is hospitalized for twenty-four hours and no breakfast allowed, the injection being made during the forenoon. The resultant chill and fever are treated symptomatically as required. The rise in temperature should be noted and subsequent dosages determined in accordance with the elevation. Subsequent dosages are usually ½ and ¾ minims at intervals of three to four days.

2. The case history suggests a Neisserian infection. The iritis, of course, should be treated with atropine solution strong enough to keep the pupil dilated. Hot bathing of the eye should also be done. I think it advisable to have a complement fixation test and if a Neisserian infection is present, to give a vaccine. The foreign protein typhoid given intramuscularly or subcutaneously would probably be of benefit through the reaction following, and the high fever. The history would indicate a general type of infection rather than an infection due to infected teeth or tonsils or syphilis.

2. *Question.*—I have under my care a young man 22 years of age who has a chronic gonorrheal anterior urethritis. There is no burning on urination and no frequency, but there is a persistent morning discharge if the patient milks out the urethra, and likewise there is a persistent shreddy first glass with clear second and third glasses. Prostatic massage does not yield any discharge. There are no symptoms of prostatic involvement. The treatment I have been using is irrigations with 1–5,000 potassium permanganate solution followed by injection of 5% neosilvol and pyridium, two 0.1 gram tablets t.i.d. The results of this treatment after two months are still unsatisfactory. Can you suggest any further therapy?

Answer.—The history and reported findings support the diagnosis "chronic urethritis." That the process is confined entirely to the anterior urethra is not so certain. Effective prostatic massages will always yield secretion which can be milked out to the meatus and collected for microscopic examination. A number of massages may be required before the material is finally forced through occluded ducts. To avoid misinterpretation as to the source of the contents of the secretion, the prostatic massage and collection of secretion should be carried out only after exudate in the urethra has been flushed out by voiding or by a urethral irrigation. Pus cells in the secretion indicate an inflammatory process in the prostate. This requires treatment by Kollman dilations, prostatic massages and antero-posterior irrigations. Hot rectal irrigations are also useful in the acute stages. In only a limited number of cases will the treatment thus far employed be effective in completely clearing up infection confined to the anterior urethra. Infected periurethral glands (littritis), surface granulations and mural infiltrations occur in a large proportion of cases and would explain the findings reported. These conditions are effectively treated by massages of the urethra over sounds, the passage of sounds of increasing size up to F 30 and by anterior injections of 2% mercurochrome.

3. *Question.*—The following case has stubbornly resisted treatment since coming under my observation: Male, age 40, married, the father of two children aged four and two, living and well. He is a farmer, well built and well nourished, and strong. No history of any illness until three years ago when he was laid up over three months with acute articular rheumatism. Since then he has had occasional pain in the joints once in a while, but not sufficient to need attention. Last week while haying he got something into his right eye. It was very sore and red. Two weeks later when he came to my office I found a marginal ulcer of the right cornea in addition to the general redness and inflammation. Tonsils were enlarged and crypts filled with whitish and yellow matter. Teeth pyorrheic. Advised *x*-ray and report from the dentist stated no sign of abscess. Tonsils removed under general anethesia two weeks ago. Good recovery. Urinalysis normal. Blood pressure 169/90. Have been giving him autocondensation at the office every other day the past week or two. Locally warm, wet applications, atropine, novocaine with adrenalin ointment, alternated with butyn and metaphen ointment. Also local eye wash of boric acid with zinc sulphate and aqua camphor. Internally he has been getting protonuclein tablets, now discontinued. Now getting KI, grains X, t.i.d. pc. Also cinchophen, grains V, t.i.d. Anything you

(Continued on Page 928)

MISCELLANEOUS
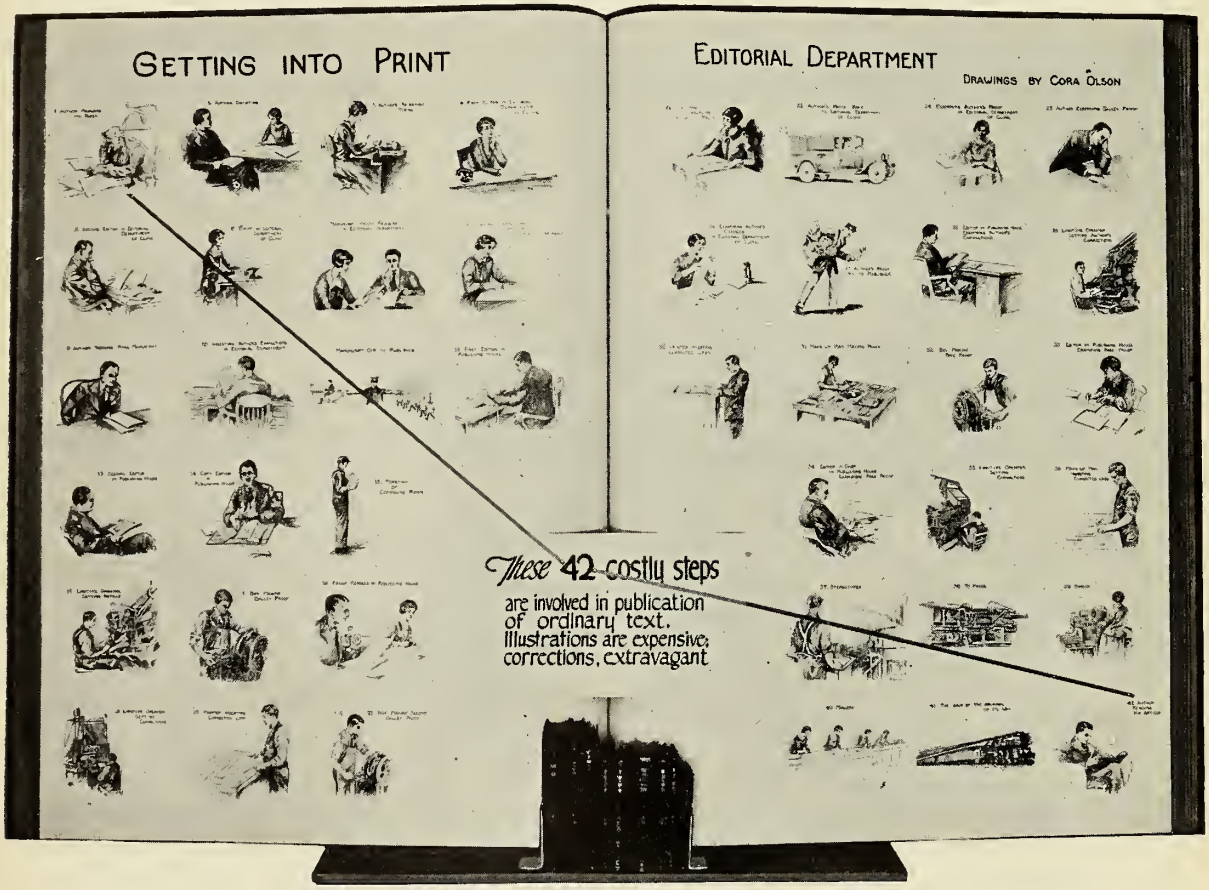
GETTING INTO PRINT: AN EXHIBIT FOR MEDICAL WRITERS*

It seems desirable that investigators who are producing material for publication should know of the attention that all they write requires. Information of this sort might result in shorter papers, elimination of non-essential illustrations, and fewer corrections in proof.

*From the Division of Publications, The Mayo Clinic, Rochester, Minnesota.

For the annual intramural exhibit at The Mayo Clinic, a replica of an open book, represented in the accompanying photograph, was constructed of wood and wall board. The book was 6 feet tall and 8 feet wide over all. Forty-two pictures were drawn or adapted to illustrate consecutive essential steps in getting an article into print. These pictures were pasted on the surfaces that represented opposing open pages of the book. The book stood against a wall on a shelf placed 20 inches above the floor, and occupied 22 inches of horizontal space.

RICHARD M. HEWITT, M.D.



The replica of the open book. Because of reduction, the numerals and legends of the drawings are difficult to read. They are as follows: 1. Author preparing his paper. 2. Author dictating. 3. Author's secretary typing. 4. First editor in editorial department of clinic. 5. Second editor in editorial department of clinic. 6. Typist in editorial department of clinic. 7. Manuscript proof readers in editorial department. 8. Making corrections on manuscript in editorial department. 9. Author reading final manuscript. 10. Inserting author's corrections in editorial department. 11. Manuscript off to publisher. 12. First editor in publishing house. 13. Second editor in publishing house. 14. Copy editor in publishing house. 15. Foreman of composing room. 16. Linotype operator setting article. 17. Boy making galley proof. 18. Proof readers in publishing house. 19. Linotype operator setting corrections. 20. Printer inserting corrected lines. 21. Boy making second galley proof. 22. Verifying corrections on galley proof. 23. Author's proof back to editorial department of clinic. 24. Examining author's proof in editorial department of clinic. 25. Author examining galley proof. 26. Examining author's changes in editorial department of clinic. 27. Author's proof off to publisher. 28. Editor in publishing house examining author's corrections. 29. Linotype operator setting author's corrections. 30. Printer inserting corrected lines. 31. Make-up man making pages. 32. Boy making page proof. 33. Editor in publishing house examining page proof. 34. Editor-in-chief in publishing house examining page proof. 35. Linotype operator setting corrections. 36. Make-up man inserting corrected lines. 37. Stereotyper. 38. To press. 39. Binder. 40. Mailers. 41. The issue of the journal on its way. 42. Author reading his article.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

STATE OF MINNESOTA *vs.* MASON

On November 12, 1930, the above defendant, Elmer Mason, entered a plea of guilty of practicing healing without a Basic Science certificate before the Honorable Judge Gates at Winona, Minnesota.

Mason was the ringleader of a group of Indian doctors who, during July and August, sold between four and five thousand dollars' worth of Indian roots and herbs to the citizens of Fillmore and Houston Counties.

Another member of the group has completed a sixty day sentence in the county jail of Houston County.

Judge Gates, after hearing the facts in the case, sentenced Mason to serve three months at hard labor in Houston County. This sentence means that Mason will be put to work in the rock quarry where Houston County obtains the material for its roads. Sentence like this will go a long way toward preventing any return of quacks in that part of the state.

Judge Gates is to be commended for his firmness in the disposition of this matter.

Mr. Brist representing the State Board of Medical Examiners reports the finest of coöperation from Mr. Flynn, the County Attorney, and Sheriff Brown.

HOSPITAL CHART OWNERSHIP

The following letter written by Mr. F. M. Brist, attorney for the Minnesota State Board of Medical Examiners, contains legal opinion in answer to several questions which are likely to occur to physicians and hospital authorities and therefore merit publication:

September 15, 1930.

J. P. McDowell, M.D.,
St. Cloud, Minn.

Dear Dr. McDowell:

In answer to your two previous written inquiries concerning the ownership of a hospital chart and certain other questions concerning the rights and liabilities of the hospital in connection therewith I set out below your questions, the answers thereto and my reason for the same:

Q. 1. To whom does a hospital chart belong?

A. To the hospital.

Q. 2. May a patient demand his chart, read it or take it with him?

A. Any patient may demand his chart, that is, he may demand to read it or take it with him, but it is my opinion that his demand does not need to be complied with. As a matter of general policy I would advise that a patient while a patient of a hospital be permitted to see his chart if he so requests but under no circumstances would I permit him to take the chart with him.

Q. 3. If a Court's order is obtained, then is the chart to be turned over to someone outside the hospital or does a hospital representative take the chart to the court room and keep it in her or his possession and take it back to the hospital when the Court has finished with it?

A. If a subpena duces tecum is served upon the superintendent of a hospital, that subpena requires the appearance of the person named in the subpena, usually the superintendent, in Court at a specified time, together with the records described in the subpena. Therefore the chart under no circumstances should be turned over to someone outside the hospital. The hospital representative takes the chart or other record to the court room and keeps it in his or her possession and takes it back to the hospital unless the original record or chart is introduced as an exhibit in the case, in which event the courts usually allow a motion to withdraw the exhibit from the evidence or order its return after the case has been submitted to either the court or jury as the case may be. There are cases where the original exhibit, such as the chart or other records, is not introduced in evidence but upon agreement of counsel the items appearing upon the record or chart are read into the record as part of the evidence after the chart or record has been sufficiently identified to show that it is an authentic record.

Q. 4. May a patient, doctor or anyone else demand a hospital chart and hope to get it without a court order?

A. As previously stated, anyone may demand the chart, but in my opinion it does not need to be surrendered to anyone except as stated above where a subpena duces tecum has been served on the hospital.

Q. 5. May a patient or representative of a patient demand a copy of a chart?

A. The patient or representative may demand a copy of the chart but it is my opinion that such a demand need not be complied with. If such a demand is made the demand itself should be sufficient to put the hospital on an inquiry as to the reason for the demand being made. It is a matter of common knowledge that patients do not demand the hospital chart nor a copy of the same except under unusual circumstances, that is, unless there be an action pending in court either against the hospital, the attending physician, or both, or in cases involving an action under an insurance policy.

Q. 6. Has a second doctor with or without the consent of the patient the right to demand the chart kept of this patient by another doctor at some previous time?

A. Doctor number 2 has a right to make the demand but it is my opinion that the hospital is under no obligation to exhibit or turn over to the second doctor a chart made during the treatment of the patient by a previous doctor. I call your attention to the fact that your question number 6 states that the chart was made by another doctor. I am answering all of your questions on the theory and on the assumption that no chart is made by the attending physician but rather that the chart is made by someone in the employ of the hospital.

The last question in your first letter, "Just whose property is the hospital chart?" This is answered in question 1.

I have very carefully considered the questions personally and I find that we have no statutory law in Minnesota on the subject of the ownership of a hospital chart. In other words there is no statute in Min-

nesota that compels a doctor or a hospital to keep a hospital chart. Section 5362, Mason's Minn. Statutes for 1927, makes it mandatory that "all superintendents, managers or persons in charge of lying-in or other hospitals, almshouses, charitable or other institutions, public or private, to which persons resort for confinement, treatment of disease, care, or are committed by process of law, shall, at once, make and preserve a record of all the personal and statistical particulars relative to the inmates now in, or hereafter admitted to their institutions, that are required to be stated in the certificate of birth and death provided for by this act and on or before the tenth of each month shall file with the state board of health, on a blank provided by such board for the purpose, a report of all births and deaths, or still-births, occurring in such institution during the previous month. If admitted for medical treatment of disease the physician in charge shall specify, in the record, the nature of the disease and where it was contracted."

However, you will note that the information there required to be kept is only that information that is required to be stated in the certificate of birth and death.

Section 4314, Mason's Minn. Statutes for 1927, provides that the records kept by a hospital of the medical or surgical treatment given to an employee in such hospital shall be admissible as evidence of the medical and surgical matters stated therein, but shall not be conclusive proof of such matters.

Section 4314 above quoted applies only to cases coming under the Workmen's Compensation Act. The section quoted is not in the chapter on Witnesses and Evidence. It is to be found only in the chapter entitled Workmen's Compensation Act and is applicable only thereto.

I call your attention to Sec. 9814, Mason's Minn. Statutes for 1927, which provides that every person with sufficient understanding may testify in any action or proceeding, civil or criminal, in Court or before any person who has authority to receive evidence, except as follows:

Sub. 4. A licensed physician or surgeon shall not, without the consent of his patient, be allowed to disclose any information or any opinion based thereon which he acquired in attending the patient in a professional capacity and which was necessary to enable him to act in that capacity.

The question of the ownership of a hospital chart has never been before a court of final resort in this state or a court of last resort in any state in so far as we have been able to ascertain. This makes it necessary for one to go into the history of a chart and the relationship existing between the patient and the hospital.

In the first place the relationship existing between the hospital and patient is a contractual one, the hospital agreeing to furnish certain facilities and certain care while the patient is an inmate of the hospital for reasonable compensation, which compensation may or may not be agreed upon in any definite amount at the time of the admittance of the patient to the hospital. As previously stated there is no statutory obligation on the part of a hospital to keep a chart. The patient comes to a hospital to be cared for while under the treatment of either a private physician or in some cases treatment of a physician in the employ of the hospital. Hospital charts are kept so that the attending physician and those in charge of the hospital may have a better knowledge of the trend of the patient's case from day to day and have knowledge of certain medicinal administrations and other things done for the patient. There no doubt was a time when hospital charts were not kept just as there was a time when fractures were set without x-ray pictures being taken. We did not always have available the x-ray and no doubt there is work done today without the aid of the x-ray. Take a concrete case for example. A patient goes to a hospital to be operated upon for the removal of gallstones; an x-ray picture is undoubtedly taken to confirm the diagnosis. The surgeon performs the operation, removes the gall stones; the hospital through its employees ministers to the necessities of the patient. The patient pays for this service, however. The patient did not come to the hospital to buy x-ray pictures nor to buy hospital charts. It is true that the cost of rendering that service is included in the patient's bill. The patient did come to the hospital for the treatment and removal, if necessary, of the gallstones. If that service is rendered and the gallstones are removed, whether the patient recovers or not the service that the patient contracted for has been rendered. There is no liability on the part of the doctor nor the hospital if the patient should not recover unless there has been negligence on the part of either the hospital or the attending physician. Such negligence, before liability can be established, must be the approximate cause of the death of that patient.

Another vital reason for the keeping of hospital charts is for the protection of the hospital as well as the attending physician. Patients sometimes do become dissatisfied with the treatment previously given because they develop some further disorder, or perhaps for a recurrence of their former ailment they may prefer to consult another doctor who may or may not criticise the treatment described by the patient as having been previously given. This is one reason why hospitals should maintain a chart and a complete record of the case from start to finish, such record to be the absolute property of the hospital and to be preserved for a length of time at least equivalent to the statute of limitations relating to malpractice suits, and in my opinion for a considerable longer period. I can see no reason based on any sound theory why the second doctor in a particular case should feel that he has an absolute right to even see the chart prepared by the hospital in former treatment of that patient. I would advise, as a matter of business, unless there is some good objection to the contrary, that such a courtesy be extended to the doctors who subsequently treat a patient and in no event should hospital charts be kept where they can be removed or copied, as you mention in your letter of September 5th. If the patient has a meritorious action pending in court and the patient desires the hospital chart he has available a proper manner in which to obtain the same.

Under no circumstances should a hospital at any time be in the position of not having a record of the patient, as you state in your letter. Before a hospital chart is taken to court a copy should be made of that chart and retained by the hospital. There is no reason why any expense incident to the furnishing of a copy of the chart should not be borne by the party requesting the same.

Our Supreme Court has held in the case of Price vs. Standard Life and Accident Insurance Co., 90 Minn. 264, that the entries made by the superintendent in charge of a hospital could not be introduced in evidence because they constitute hearsay testimony and furthermore violated the statute prohibiting the examination by a physician as to certain matters without the consent of his patient.

This matter was before the Supreme Court of Michigan in a case wherein the Mass. Mutual Life Ins. Co. brought a mandamus action against the Board of Trustees of the Michigan Asylum for the Insane to compel the Board of Trustees to permit the insurance company to inspect the records of the asylum. The purpose being to obtain information concerning the mental and physical condition of a patient. Their action was based on the theory that the records of an insane asylum are public records and that at common law public records could be inspected. The Supreme Court of Michigan denied the writ of mandamus and cited the Price case above quoted. The Court held that the information contained in the records was strictly confidential and obtained while the relationship of patient and physician existed.

There is no question but what if the patient desires the matters shown in the record or chart to be aired in court it can be done by simply subpenaing the doctor and the person in charge of the records in the hospital. I would suggest, however, that when the hospital prints its forms for the keeping of these records and charts, a statement be printed upon the face of each one to the effect that the records or the chart, such as the case may be, are the property of the hospital and are not to be altered, copied or removed without the consent of the hospital. I also think that there should be some improvement in the manner in which charts are kept around a hospital. It should be made a very difficult matter for anyone to copy or remove the chart without the consent of the hospital.

It will be seen from the foregoing that the rights of all the parties concerned in this question depend first of all upon the ownership of the chart. It is my opinion for the reasons heretofore stated that the chart belongs to the hospital. As a matter of policy I believe that when requested patients, while patients of the hospital, should be permitted to examine their chart. If such a policy were established it would be conducive to the orderly keeping of the charts and it would lead to the hospital making every effort to keep a correct chart and one that could be proudly and successfully exhibited in Court. I trust that the foregoing will assist in clarifying the situation for you people.

Very truly yours,
(Signed) F. M. Brist.

FELLOWSHIPS FOR TRAINING IN EXTRAMURAL PSYCHIATRY

The following announcement is made by the National Committee for mental hygiene:

Minimum Requirements for Applicants—

These fellowships are designed to provide special training for physicians who have had previous hospital training in psychiatry but who wish to prepare themselves for extramural work in the fields of child guidance, delinquency, education, dependency, and industry.

Fellowships are open to physicians who are:

1. Under thirty-five years of age,
2. Graduates of Class A medical schools, and
3. Who have had at least one year of training in a hospital for mental disease maintaining satisfactory standards of clinical work and instruction. A longer period of hospital training is desirable.

Applicants able to meet these requirements will not be required to take competitive or oral examinations. Selections will be made on the basis of length and type of previous training in formal psychiatry, on general fitness for the work contemplated, and (in most cases) on the results of a personal interview.

General Details of Fellowships—

1. These fellowships cover a period of training approximately one year in length.
2. During this training period trainees usually are assigned for three to four months' periods at such places as the Boston Psychopathic Hospital; Judge Baker Foundation, Boston; Institute for Juvenile Research, Chicago, and other places of a similar nature, as well as to various child guidance clinics located in Cleveland, Philadelphia and other cities. Assignments to these training centers are not definite, however, and assignment to any given place will depend upon the availability of instruction at such place, as well as the special needs of the individual trainee. Assignments are not made for more than three months in advance, and adherence for the year's training period to a fixed program in advance is impossible.
3. These fellowships carry stipends at the rate of $2,000 to $2.500 for the twelve months' period.
4. Applications need not be filed within stated periods but will be received at any time. In the case of successful applicants, arrangements will be made to begin work whenever mutually convenient to the applicant and to the director of the training center to which the applicant is first assigned.

Applications or inquiries for further information should be sent to Dr. Frankwood E. Williams, Medical Director, National Committee for Mental Hygiene, 370 Seventh Avenue, New York, N. Y.

Plant's Magnesia Wafers.—Wafers, each containing magnesium hydroxide 0.3 Gm. (4.64 grains) compressed with the addition of sucrose and starch and essential oils as flavors. Used as an alkaline laxative and antacid. The magnesium content of each wafer is approximately equivalent to that of 4 c.c. of magnesia magma U. S. P. Plant Products Co., Cleveland, Ohio. (Jour. A. M. A., September 27, 1930, p. 935.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association
Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of December will be as follows:

December 3—Gall Stones.
December 10—Mental Hygiene.
December 17—Christmas Seal.
December 24—Aseptic Surgery.
December 31—Cancer of the Skin.

MINNESOTA STATE MEDICAL ASSOCIATION

The 1931 annual meeting of the Minnesota State Medical Association will be held in Minneapolis at the Nicollet Hotel, May 3, 4 and 5.

This meeting will be the 78th annual gathering of the association dating from 1853, the new date for the founding of the original society accepted by the House of Delegates at the suggestion of the Historical Committee at the last annual session in Duluth.

Plans for a large and important meeting are already being formulated. Resources of the University medical school and hospital will be utilized to the fullest to make it a scientifically memorable meeting.

MINNESOTA RADIOLOGICAL SOCIETY

At a meeting of the Minnesota Radiological Society held at the University Hospital, Minneapolis, Minnesota, on October 25, 1930, the following program was presented:

Roentgen Studies on the Onset of Lobar Pneumonia: Walter H. Ude, M.D., Minneapolis. Discussed by George E. Fahr, M.D., Minneapolis.

Childhood Tuberculosis: Malcolm B. Hanson, M.D., Minneapolis. Discussed by Jay A. Myers, M.D., Minneapolis.

Lympho-Epithelioma: A. U. Desjardins, M.D., Rochester.

Air Injection in the Diagnosis of Lesions of the Colon: Harry M. Weber, M.D., Rochester.

Roentgen Therapy in Carcinomatous Metastases to Bone: K. W. Stenstrom, Ph.D., and L. G. Erickson, M.D.

An informal dinner was held at the Town and Country Club, Dr. W. A. O'Brien acting as toastmaster. The Society was honored by the presence of two distinguished guests, Dr. James M. Martin of Dallas, Texas, and Dr. Bernard H. Nichols of Cleveland, Ohio. The following papers were presented:

Significance of Small Intestinal Gas in the Diagnosis of Bowel Obstruction: Edward Schons, M.D., St. Paul.

Clinical and Experimental Studies on Intestinal Obstruction: Owen H. Wangensteen, M.D., Minneapolis.

Intravenous Urography: Bernard H. Nichols, M.D., Cleveland, Ohio.

At the business meeting new officers were elected for the coming year as follows: Dr. B. H. Kirklin of Rochester, president; Dr. Gage Clement of Duluth, vice president, and Dr. Leo G. Rigler of Minneapolis, secretary-treasurer.

The time and place of the next meeting will be decided by the Executive Committee at an early date.

Leo G. Rigler, *Secretary.*

WOMEN'S AUXILIARY
Minnesota State Medical Association

Officers

Mrs. S. S. Hesselgrave	President	St. Paul
Mrs. James Blake	President-Elect	Hopkins
Mrs. Roy Andrews	First Vice President	Mankato
Mrs. F. J. Elias	Second Vice President	Duluth
Mrs. C. S. Sutton	Third Vice President	St. Cloud
Mrs. E. S. Boleyn	Recording Secretary	Stillwater
Mrs. Edward Schons	Corres. Secretary	St. Paul
Mrs. A. W. Coventry	Treasurer	Duluth
Mrs. John Catlin	Auditor	Buffalo

Committee Chairmen

Mrs. James Blake	Organization	Hopkins
Mrs. Hugh J. Tunstead	Legislative	Minneapolis
Mrs. Ben F. Davis	Public Relations	Duluth
Mrs. A. A. Passer	Editor	Olivia
Mrs. Carl Larsen	Finance and Budget	St. Paul
Mrs. E. A. Meyerding	Press and Publicity	St. Paul
Mrs. C. C. Chatterton	Social and Program	St. Paul
Mrs. J. R. Peterson	Social and Program	Minneapolis
Mrs. W. J. Byrnes	Parliamentarian	Minneapolis

Presidents of County Auxiliaries

Blue Earth County	Mrs. J. S. Holbrook	Mankato
Camp Release	Mrs. A. A. Passer	Olivia
Hennepin County	Mrs. James Blake	Hopkins
McLeod County	Mrs. T. J. Trutna	Silver Lake
Park Region	Mrs. W. W. Drought	Fergus Falls
Ramsey County	Mrs. E. M. Hammes	St. Paul
Red River Valley	Mrs. H. Froelich	Thief River Falls
Rice County	Mrs. A. M. Hanson	Faribault
Stearns-Benton	Mrs. Warner Hemstedt	St. Cloud
St. Louis County	Brs. F. N. Knapp	Duluth
Washington County	Mrs. J. W. Stuhr	Stillwater
West Central	Mrs. C.F. Ewing	Wheaton
Wright County	Mrs. John Catlin	Buffalo

The tentative plans of the Women's State Auxiliary include:

1. The organization of twenty-three auxiliary societies (thirteen now organized).

2. Legislative Committee activity at the call of the Legislative Committee chairman of the State Medical Association when needed during the session of the legislature, a legislative chairman to be appointed in each county.

3. Health education through parent-teacher associations and other clubs by means of medical literature and lectures. The placing of health journals in schools and libraries.

4. The establishment of loans for medical students and nurses. Several county auxiliaries have made loans to student nurses, an activity recommended by both state and national auxiliaries.

5. Assisting county health units in Christmas seal sales.

6. Increasing the present membership of 838. Minnesota now ranks third among the state auxiliaries.

Mrs. S. S. Hesselgrave, Saint Paul, president of the Women's Auxiliary of Minnesota, and Mrs. James Blake, Hopkins, second vice president of the National Auxiliary, attended the executive board meeting of the National Auxiliary in Chicago, Friday, November 14, 1930.

Mrs. James Blake, president-elect, and former editor of the State Auxiliary, has turned over her work to Mrs. A. A. Passer of Olivia, who with the able coöperation of Mrs. E. A. Meyerding of Saint Paul, chairman of Press and Publicity, will have supervision of the Auxiliary column in MINNESOTA MEDICINE. The assistance of all local county auxiliary editors in sending in clippings of social and other activities of the auxiliary societies is requested.

HENNEPIN COUNTY AUXILIARY NEWS

The members of the Auxiliary of the Hennepin County Medical Society were hostesses to the visiting wives and daughters of the physicians attending the International Medical Assembly the week of October 20th to 24th. Mrs. Stephen Baxter was the general chairman for the entire week, with a group women assisting for the various activities. Mrs. Martin Nordland had charge of registering the guests. She reports 311 women (not including Minneapolis and St. Paul) given badges from her desk. These women were from thirty-two states and eight different locations in Canada.

Many social affairs—teas, luncheons, dinners and drives were planned for the visitors and were much enjoyed by guests as well as hostesses. The Ramsey County Auxiliary gave a musical tea and drive in compliment to the guests of the Hennepin County Auxiliary which was one of the outstanding features of the week. A rest room and lounge furnished by one of the Minneapolis stores at the Auditorium served as a rendezvous for both doctors and their wives. The Hennepin County Medical Library rooms were turned over to the women for the week, and were used for much informal entertainment all during the Assembly, including a tea on Tuesday and a bridge party on Friday.

This is the first time in the history of the International Assembly that an Auxiliary has taken over and entertained the ladies attending the meeting. The innovation proved a success, so much so, that the doctors in charge of the program decided to adopt the idea as a regular feature, and the Auxiliary in Milwaukee next year will be approached to do the same stunt, and the Hennepin County women wish them "good luck."

(MRS. JAMES) AGNES BLAKE.

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of October 2, 1930

The regular monthly scientific meeting of the Minneapolis Surgical Society was held in the lounge of the Hennepin County Medical Society in the Medical Arts Building on Thursday evening, October 2, 1930, at 8 o'clock, Dr. A. T. Mann, President, presiding.

The meeting was called to order by the President, Dr. A. T. Mann. There were 21 members and 2 visitors present.

Minutes of the May meeting were read and approved. The Committee on revision of the Constitution and By-laws reported the changes which had been made, and a motion was carried that these be approved as read.

The scientific program consisted of two case reports and a thesis.

Dr. O. W. YOERG reported a case of Actinomycosis of the Abdomen.

The patient is a woman 44 years of age. Her past history is negative. She is the mother of four children, the youngest eight and the oldest fourteen. Her history was negative until February, 1928, when she was taken with what appeared to be an attack of acute appendicitis. An abscess was found, the appendix was removed and drainage instituted. She had a normal convalescence. The wound healed within four or five weeks and remained healed. She went back to her home on a farm and continued well for almost two years. She then went to her home doctor complaining of pain and a swelling in the right abdominal wall to the left and a little above the old appendix scar. The doctor watched her for a few weeks and then opened the indurated swelling and found a thin serous pus. That was in December, 1929.

In January, 1930, Dr. Yoerg saw her and his first impression was that a piece of gauze or something had been left in the abdomen at the time of operation. Under local anesthesia he opened the abdominal wall widely and found a number of sinuses and abscess cavities. Sections were taken and Dr. Smith, pathologist at Northwestern Hospital, reported nothing more than inflammation of a chronic type. The condition improved and finally healed. Two months later the patient developed a mass on the left side of the abdomen. This was hard and as it became larger her doctor opened it and found several abscesses on the abdominal wall. In April, 1930, Dr. Yoerg again opened the abdominal wall on the left side, this time under general anesthesia, and found sinus after sinus. Several sections and also some pus were taken at this time, and again the report came back from the laboratory that it was inflammatory. Dr. Yoerg stated that the diagnosis uppermost in his mind was a foreign body; it did not appear to be tuberculosis. He wished to state, however, that he had thought of actinomycosis and had looked for the granules but had found none.

In June, 1930, the patient returned to Northwestern

Hospital. She was anemic and complained of pain in the right leg. There were numerous sinuses over the abdominal wall. Gastrointestinal *x*-rays made at this time were negative. The leukocyte count was about 10,000; temperature ranged from 99.5° to 102° and 103°. A number of men saw her, among them Dr. Bulkley, who confirmed Dr. Yoerg's diagnosis of a foreign body. The abdomen was again opened and an abscess was found. Inside this abscess cavity was a mass which shelled out very readily; this mass appeared to be ovary, but on opening was found to be infiltrated with pus. This specimen was sent to the laboratory. Unfortunately a fecal fistula formed after this operation. On account of Dr. Smith's absence, the specimen was sent to Dr. Drake at the Swedish Hospital. About a week later Dr. Drake reported to Dr. Yoerg that he had found the ray fungus in the specimen. Since then Dr. Yoerg had also found a granule, the only one he had been able to find so far in the case.

The woman is still in the hospital and has considerable edema in the right leg although the pain has been less. Her hemoglobin is down to about 30 per cent. She was put on potassium iodid but did not tolerate it. This was discontinued and she was put on Lugol's, which she tolerates very well. In addition to this medication, Dr. Allison has given her four doses of deep *x*-ray therapy. The fecal fistula closed in about three weeks and since then the patient has apparently been holding her own. Dr. Yoerg said, however, that yesterday he could feel a mass just above the bladder.

Dr. Yoerg stated that his reason for reporting the case was that abdominal actinomycosis is rare, especially in women. The best information he could find was in an article by Sanford of Rochester, who had collected reports from various hospitals and Boards of Health and had found 690 cases reported in the United States up to 1926. Out of this number 80 per cent were in men. And only about 18 to 20 per cent of all actinomycosis is abdominal.

DISCUSSION

Dr. Willard White asked Dr. Yoerg if he had used copper sulphate in this case.

Dr. Yoerg stated that Bevan, in Chicago, was the first man to use copper sulphate extensively, but some men seem to think it does not change the results. He also stated that actinomycosis rarely follows the lymphatics; it goes by extension and may invade the veins; but whether or not the lymphatics are entirely free, he did not know. It does follow along tissue contiguous to the lymphatic.

Dr. E. K. Green asked Dr. Yoerg's opinion as to the portal of entry.

Dr. Yoerg replied that this is open to question. Some authorities claim that it is not transmitted from cattle to man; whether it is or is not, is a moot question. It is found in some grains and grasses and it is thought that people pick up and chew the grasses and the disease enters the system in that way. The usual case, of course, is "lumpy jaw." Most of the abdominal cases which Dr. Yoerg had found reported gave a history of having had an operation for appendicitis. In his own case just reported, Dr. Yoerg said there is a question in his mind as to whether the condition was there at the time of the appendicitis operation, since the patient had recovered and had remained well for almost two years.

Dr. O. H. Wangensteen stated that they had had two cases of abdominal actinomycosis at the University Hospital. A lethal outcome obtained in both instances and he understood that to be the usual occurrence in most instances of abdominal actinomycosis. The usual origin of the abdominal type is in the cecum; infrequently, however, as Bruce of Toronto has pointed out, the disease in the cecum itself heals, leaving no vestige of its previous existence there, but an induration of the abdominal wall and sinuses persist. This form of the disease is more likely to get well. Bruce has suggested "right lower quadrant" actinomycosis as being a more appropriate designation than cecal actinomycosis.

This tendency for the site of origin of the disease to heal completely is a well-known fact in the facial and cervical types of the disease. The patient usually contracts actinomycosis by chewing grain or grasses; the organism, *Actinomyces bovis,* lodges about the teeth, and when the diagnosis is apparent no trace of the disease can usually be seen within the mouth.

Recently a patient with an abscess of the tongue presented himself for examination at the University Hospital. It was first believed that this was an abscess of the unobliterated upper portion of the thyroglossal duct tract. Most primary abscesses of the tongue, however, are due to actinomycosis and when search was made for the organisms they were readily demonstrated.

The results of treatment of actinomycosis on the whole are unsatisfactory, due largely to the fact that most cases present themselves late for treatment. Sporotrichosis is the only fungus infection in which iodine is a specific. The actinomyces may grow in a solution of potassium iodid. Iodine given in large doses, however, appears to be of definite value. Good results in the cervico-facial type have been obtained with deep *x*-ray and radium treatment. In the early case, however, curettement or surgical excision appear to be measures of greater value. The local use of copper sulphate, as suggested by Dr. Bevan in the treatment of blastomycosis, is of no value.

Dr. E. A. Regnier recalled a case of abdominal actinomycosis in a woman whom he operated upon three years ago. The case was that of an appendiceal abscess, which was drained. The abdominal wound healed in three weeks. The patient returned three weeks later with high fever, and pain in the upper right quadrant. At this time a subphrenic abscess was drained by a two-stage operation. A large quantity of serosanguinous pus was removed. On the third day sulphur granules were recovered from the wound. The singular finding in this case was that the appendix, which was about one inch in diameter, was sectioned serially, and no signs of actinomycosis were found. Dr. Regnier said he had looked up the literature at that time and most writers were of the opinion that the disease was spread by contiguous infection. In his

own case, the first manifestation was the subphrenic abscess, which speaks for infection through the lymphatics. The infection never appeared in the abdominal wall, but multiple sinuses appeared in the dorso-lumbar region. In looking up the subject of therapy, he found that almost everything had been used. In Dr. Regnier's case, massive doses of deep *x*-ray, and potassium iodide by mouth, had been used but therapy had no effect on the progress of the disease.

Dr. A. T. Mann stated that he had seen two such cases and in both of them the discharge contained a fair number of these bodies; in fact the sulphur granules could be seen with the naked eye quite readily.

In regard to the character of the growth and the pathology, Dr. Mann stated that it is the result of an irritation of the tissues, a granuloma in its growth. There is more or less destruction of the cells immediately about the infecting fungus, followed by attracted leukocytes and the proliferation of granulation tissue round about it. As a rule it is very slow to produce pus. The streptothrix does produce pus at times and some of the granuloma breaks down, but a good many of the suppurations come from secondary infection in the area of these granulomata. One might be misled in making an early diagnosis because of the firmness of the enlargement, and think the case possibly a sarcoma.

As to the spread of infection, secondary infection, and so on, Dr. Mann said that it is most like a septic pyemia or like sarcoma in its secondaries. The granulations grow into the veins and produce a secondary involvement from small emboli mostly, just as the secondary infection from pyemia and from sarcoma.

Dr. Mann said that what had been stated tonight in regard to treatment he had found to be true when he was reading the literature on this subject. Many things had been tried, but potassium iodide seems to be considered more favorably than any other one thing. And while it is true, as Dr. Wangensteen stated, that the streptothrix will grow in a solution of 1 to 2 per cent potassium iodid, that is not all there is to medication. It may also do something toward stimulating the surrounding tissues or other groups of tissues, with resulting destruction of the stroptothrix.

Dr. Mann also called attention to the fact that although most of these infections are supposed to get in with some food, about 20 per cent of the cases are found in people who have cavities in the teeth and the streptothrix has been found in the teeth; in fact it is sometimes found in the teeth cavities when the actinomycosis is not active in the patient.

Another interesting feature is the number of cases of infection of the lungs, with symptoms simulating tuberculosis of the lungs, and in which the resulting deaths have been credited to tuberculosis.

Dr. Yoerg, in closing, stated that in Sanford's collection the larger percentage of cases were found in the upper Mississippi Valley. Various treatments had been tried; some had used salvarsan, and some had given yeast. This was the first abdominal case Dr. Yoerg had seen and it occurred to him that opening up the abdominal wall, curetting the sinuses and packing them would yield the best results. He thought the trouble lay deeper; that it was intra-abdominal and probably involved the veins of the hip and thigh.

Dr. R. C. Webb and Dr. E. R. Anderson reported a case of Abscess of the Liver Complicating Acute Appendicitis.

Dr. Webb presented the patient, a fifteen year old boy, on whom he had operated for ruptured appendix one year ago. He called attention to the scar of the appendicitis operation and stated that the drainage used was the Gibson tampon described by him before this Society in 1923. No sutures were used in the wound. Three weeks later it was necessary to make an upper right rectus incision and drain a liver abscess. He asked the members to notice the absence of hernia in the lower scar even though it was a very large wound without sutures. In the first operation it was the usual serious ruptured appendix case. Dr. Webb asked Dr. Anderson to read the case report and review of the literature. (The case to be published as a separate paper in Minnesota Medicine.)

DISCUSSION

Dr. J. A. Johnson said the doctors should be congratulated in having secured this boy's recovery. He had seen four cases of liver abscess secondary to appendicitis. They all died. In every one of them the liver was filled with miliary abscesses, some of which had broken down into larger abscesses. Dr. Johnson said he could not see how this type of liver infection could recover. This led him to believe that one should undoubtedly consider two types of liver abscess, *i. e.*, the miliary type with diffuse abscesses, which undoubtedly does not recover; and the other, perhaps the occasional one, with a single abscess, which does recover. He believes that surgery should be resorted to in these cases because without it the outcome is usually hopeless.

One point Dr. Johnson wished to stress in regard to aspirating liver abscess. Many years ago he was present at a postmortem in which the man had had a liver abscess aspirated. The pus was very thick and did not flow through the needle and several attempts had been made in different parts of the liver to find the abscess. At postmortem every place the needle had been inserted a new culture had been implanted and there was an abscess from each needle insertion. Since that time he had always been very careful, using very large needles, and always changing the needle each time a puncture is made in a different location.

Dr. W. P. Herbst, in discussing the matter of drainage of liver abscess, thought that the method of sewing the liver to the abdominal wall was probably one of the main factors in the recovery of the patient. He stated that some men, in draining liver infections, would sew the area around the abscess to the peritoneum of the abdominal wall, leaving the wound open and later opening the abscess when the infected area was walled off from the peritoneal cavity. Where the anatomical relationships do not allow this sort of procedure, the next best thing is to use large amounts of

iodoform gauze to form a walled-off area in the region of the abscess to prevent abdominal infection. The method is one of walling off the abdominal cavity.

Dr. Theodore Sweetser called particular attention to the importance of chills in raising the suspicion of possible liver abscesses. He also called attention to the good fortune in Dr. Webb's case, in that there was no infection of the portal vein system. In entering the liver, the infection evidently did so without a purulent infection of the veins, which of course would have made the case almost hopeless.

Dr. Leo Murphy thought it would be interesting to know whether the cases reported are based on single or multiple abscesses of the liver. He felt that Dr. Johnson's point was very pertinent as far as liver abscess is concerned.

Dr. Martin Nordland said that it would be natural to question what the surgeon could do to prevent an abscess of the liver when operating upon a case of suppurative appendicitis. He advised applying the ligature to the meso-appendix as far away from the appendix as possible, as suggested by Dr. Jackson. This would exclude the thrombi in the small veins.

Dr. Theodore Sweetser suggested, as a measure for the prevention of such disasters, that the meso-appendix be carefully observed in order to discover thrombosis of any veins, ligating beyond any thrombus found.

Dr. Wangensteen felt that the point raised by Dr. Sweetser with reference to the occurrence of chills in acute appendicitis was very significant. While a junior house officer at the Colonial Hospital in Rochester he recalled seeing a patient who gave this history early in the course of the disease. No special note was made of the chills by the surgeon in attendance. At operation a diffuse suppurative process without peritoneal extension was found. In the course of the disease, chills continued and the patient died. At autopsy a pylephlebitis and multiple abscesses in the liver were found.

The occurrence of chills is synonymous with the presence of bacteria in the blood stream and in acute appendicitis it signifies thrombosis of the mesenteriolum of the appendix. Professor Melchior of Breslau has performed a successful secondary operation when chills occurred in the immediate convalescence after appendectomy, ligating and excising the mesenteriolum of the appendix high in the ileocecal angle. Melchior states that about eight successful secondary operations of this nature are to be found in the literature.

Dr. Mann said he wished to call attention to one point in regard to statistics showing the high percentage of liver abscess after appendicitis operations in the old reports. He said that in those days cases of appendicitis did not usually get into the hospitals unless they had an abscess and almost every operation in those early days was a pus appendix. He believed if the later statistics could be revised, taking only the abscess cases, one might get figures nearer the older statistics. He felt that the real point in the mortality of these cases lay in the fact that there is an accompanying septicemia or there are multiple abscesses. He was of the opinion that if several abscesses were close together and they could be broken down with the finger into one cavity and drained they might recover, but if there were multiple abscesses and some were not drained they are more likely to be fatal.

Dr. Webb, in closing, thanked the members for their generous discussion of the case. The boy had presented the usual appearance of a case of appendicitis, such as all the members had seen, and was one which was apparently going to die. The operation was performed as a rather extreme measure in this case, but Dr. Webb felt that, after seeing this boy and hearing the discussions of the case, the members would all have more courage to operate upon and drain these liver abscess cases earlier and more frequently than they had before.

Dr. Anderson, in closing, discussed some of the things which might be done to prevent liver abscess and stated that Wilms resected the veins that were thrombosed in the ileocecal angle and had cases of recovery. Braun ligated the ileocolic vein and has reported successful cases. Colp of New York experimented with gradual ligation of the portal vein in dogs and they lived. He tried the same procedure on three patients who had an extreme grade of thrombopylephlebitis and had been unsuccessful in obtaining recoveries. This was discussed to a greater extent in the paper under the section on treatment, the reading of which was omitted on account of the time limit.

Dr. Oswald S. Wyatt read his Thesis entitled "Congenital Hypertrophic Pyloric Stenosis." (To be published at a later date in Minnesota Medicine.)

DISCUSSION

Dr. Willard White stated that he had enjoyed this paper very much and there were two or three points he wanted to mention. He called attention to Dr. Wyatt's method of making an incision through the hypertrophied muscle and then continuing by spreading with forceps, but Dr. White felt that using the blunt end of the scalpel furnished a safe way to accomplish this and avoided opening the mucous membrane. He believed it advisable to close the abdominal wound with mattress sutures tied through buttons, especially if the infant was in poor condition and one wished to save time. He felt that the use of buttons was a very great advantage as the sutures would hold securely and there was very much less cutting of the skin by the sutures.

Dr. White felt that the conservation of heat during the time of operation is also an important factor, and the infant should not only be wrapped in cotton batting but the batting should previously be warmed in some kind of warming device and, in addition, hot water bottles should be kept around the infant during the time of operation.

Dr. White was of the opinion that there is very much less objection to general anesthesia in these operations than is often thought. One hears much emphasis placed on local anesthesia, and that is all right, but one's strategy is very important in these cases and un-

less the operator is very careful in the use of local he may cause pain and resulting shock; and in the avoidance of shock, Dr. White felt that general anesthetic is preferable.

Dr. Green asked Dr. Wyatt what he thought of the Strauss method of technic in the cases where a muscle flap is used to cover over the mucous membrane. Dr. Green said when he was in Chicago he heard Dr. Strauss discuss his operation at some length and also saw him do an operation. It seemed to Dr. Green that the benefit derived was hardly worth the extra time and trouble as compared to the Rammstedt operation, and he would like to have Dr. Wyatt's opinion about it.

Dr. Theodore Sweetser brought up a point which had been stressed by Dr. R. E. Farr in discussing this subject some years ago and which also had been called very strongly to his own attention in a case he happened later to see in one of the hospitals. In the latter case the baby was given ether anesthesia before the surgeon and his assistant were ready to operate, so that the baby was exposed to the anesthetic an unnecessarily long period of time. That might have been avoided under local anesthesia. If the operation is to be done under general anesthesia, everything in the operating room should be so arranged as to avoid unnecessary delay after the child is put to sleep.

Dr. Wyatt, in closing, said that he was familiar with the Strauss method of operation as mentioned by Dr. Green, but that he had never used it himself as he had had such very good results with the Rammstedt operation that he had not tried any other. In reading up on the Strauss operation, Dr. Wyatt was under the impression that it would take a little more time and he had not thought it advisable to use it.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

CONSULTATION BUREAU

(Continued from Page 918)

can suggest as to treatment will be appreciated. There are several ulcers now with punctuate cloudy spots in the cornea. Eye still red and congested, painful to the extent of interfering with sleep. Reported less painful today.

Answer.—1. From the description one would gather that the injection of the eye is secondary to the ulceration of the cornea. If this is the case the line of treatment is quite different than it would be had the ulcer resulted as a complication of the conjunctivitis. In primary marginal ulcers of the cornea one can usually trace the cause to a focus of infection somewhere in the system. It may also be due to conditions such as diabetes. Ulcers of this type are slow in healing and recurrences are frequent. The treatment usually prescribed is removal of the focus and putting the patient in the best physical condition possible. If pus is absent, put the eye at rest by keeping the lid closed. The movement of the lid tends to aggravate the condition. Bichloride ointment 1–5,000 should be applied twice daily. If, after a few days, improvement does not take place, the eye should be anesthetized with butyn and each ulcer touched with absolute alcohol, care being taken not to touch normal corneal tissue. Atropine should be used. Warm applications may be made to the eye for fifteen minutes three times a day. Dark glass over the good eye will lessen the photophobia. If the above measures do not cause healing, the thermaphore should be used. Some cases respond well to foreign protein injections, such as 5 c.c. of boiled milk. If the ulcer is secondary to the conjunctival inflammation, foreign protein therapy is advisable. The eye should be irrigated frequently with warm metaphen solution 1–5,000. The patient should be put at rest. The ulcers touched with absolute alcohol if healing does not take place. Silver nitrate 2% applied to the lids following an application of butyn is beneficial.

2. It would appear from the history of this case that the patient has a probably mycotic ulcer of the cornea. These mycotic infections are usually due to aspergillus, coming from organic foreign bodies, particularly grain. Extensive examination by smears would be advisable. The condition of the conjunctiva of the lids is not mentioned. Here, too, is a possibility of irritation of the cornea, secondary to lid involvement. If the ulcer continues to resist treatment, as outlined, I would suggest trying cautery with phenol or tincture of iodine, or the possibility of putting a Kundt flap of conjunctival over the ulcerated area.

THE ADVERTISING OF THE DENTIFRICE

The early part of the twentieth century may be interesting historically for the fact that it witnessed the apotheosis of the tooth brush, the tooth paste and the mouth wash. So far as mouth washes are concerned, their virtues may lie in a slight astringency or alkalinity, in the mildly antiseptic influence they exert for a brief period, or more probably in the fact that they contain enough water to provide a lavage appealing to the organoleptic senses. "Halitosis" gave to Listerine a sales impulse that no other mouth wash has ever been able to equal. The fact that the combination of substances included in Listerine is relatively ineffective and will not cure halitosis did not lessen the sales impulse. Recently, the Food and Drug Administration has cast a critical eye over the claims for antiseptic value made for various mouth washes and gargles. It is currently reported that the owners of all these bringers of gold are rushing hither and thither to the laboratories searching for substances that really are antiseptics and that can be added to their concoctions without changing taste or color—the important qualities—that the claims may be justified. Recently, dentifrices have been widely exploited with various claims. A half dozen assorted chemists and the commissioner of health of New York assert that low surface tension means that a tooth paste will penetrate better between the teeth. The claim of special value because of low surface tension in connection with the selling of any tooth paste is one hundred per cent hokum. Any mixture of soap, glycerin and chalk, such as is available in many tooth pastes, would be equally endowed with a low surface tension. The council on dental therapeutics of the American Dental Association is now making efforts to secure restriction of the claims for dentifrices and physicians should do all that they can to aid the American Dental Association in this campaign. (Jour. A. M. A., October 25, 1930, p. 1267.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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EYE, EAR, NOSE AND THROAT

THE FREQUENCY OF MASTOIDITIS IN INFANTS: T. C. Helwig and O. J. Dixon, M.D. (Arch. of Otolaryng., Feb., 1930, p. 1). Much controversy has arisen regarding the relationship between mastoiditis and acute nutritional disturbances in infants. The contention of most investigators has been that the ear infection acted as the primary focus and that the enteric disturbance was secondary. The result has been a marked increase in the number of ear drums lanced and mastoids operated on.

The authors were struck by the fact that in a series of 173 necropsies on patients from both the pedriatric and the otologic services, they encountered fifty-seven cases in which changes were present either in the middle ear or in the mastoid or in both.

A careful study of these 57 cases (or 32.8%) was made in an effort to determine the relationship of mastoiditis to enteritis.

Only seventeen of these fifty-seven cases showed evidence of enteric infection, while the remaining forty represented almost every common disease of infancy. The case reports show the incidence of ear and mastoid infection to be much higher in the non-enteric than in the enteric group. A careful study shows that the histologic observations fit in rather accurately with the clinical findings, and in every case the history of diarrhea antedated the ear infection.

(1) In the usual fatal illnesses of infants ear infection is a common terminal event. (2) Enteritis, as shown by necropsy, too frequently antedates the ear infection for one to assume that the latter is primary. (3) The mortality rate of these infants coming to operation has been high and distinctly out of proportion to the usual mortality rate. From this study, one concludes that although surgical mastoiditis does occur in infants, its importance has been vastly overrated.

Gerald M. Koepcke, M.D.

PEDIATRICS

PRACTICAL VALUE OF IMMUNIZATION AGAINST SCARLET FEVER WITH STREPTOCOCCUS TOXIN: T. Toyoda, J. Moriwaka, Y. Futagi and M. Okamoto. (Jour. Infect. Diseases, 46-219, March, 1930). The authors found after immunization with up to 40,000 skin test doses of the Dick toxin that over fifteen per cent of the individuals remained Dick-positive. These positive reactions were ascribed to production of allergy to the heat-stable component of the Dick toxin. On retesting this positive group with heat-labile toxin, which they consider to indicate actual immunity, these positive reactions were found to be negative. By means of prophylactic immunization of 3,197 children with the Dick toxin the scarlet fever incidence was reduced to one forty-third the rate prevalent among the unimmunized. Cases of scarlet fever occurred in children after immunization but were generally mild. The authors feel, therefore, that immunization against scarlet fever by means of the Dick toxin is of value provided 30,000 or more skin test doses are administered to make the immunization thorough. Some difficulty was encountered in systemic reactions to the naked Dick toxin. These reactions were reduced through the use of toxin detoxified by treatment with 0.4 per cent formaldehyde according to the method used by Ramon for detoxifying diphtheria toxin. The scarlet fever anatoxin prepared by treating the Dick toxin with formaldehyde and heated to 48° C. has its toxicity sufficiently reduced to render possible the administration of large amounts of the toxin without causing reactions. Anatoxin prepared in this manner, however, loses some of its effectiveness in rendering the individual immune as indicated by skin test, due possibly to a reduction in its antigenic power from the high temperature at which the anatoxin is prepared.

C. A. Stewart, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

PRIMER ON FRACTURES. Price $I. Chicago, American Medical Association, 1930.

The increased interest shown in fractures led in 1926 to the appointment of a committee consisting of Drs. Nathaniel Allison, William Darrach and Kellogg Speed by the Surgical Section of the A. M. A. to prepare an exhibit of accepted methods for treating the various common fractures for inclusion in the scientific exhibit at the annual A. M. A. meetings. This exhibit, which has been offered at the last four annual meetings excited such interest that the material presented has been put in book form and published by the A. M. A. at a very reasonable price. The book is well illustrated, brief and worth much more than the price would indicate.

OSLER'S PRINCIPLES AND PRACTICES OF MEDICINE. Revised by T. McCrae. 11th Edition. Price $8.50. New York and London: Appleton and Co., 1930.

This latest edition continues to hold the place of its predecessors as the best one-volume work on the subject. Exteriorly its appearance is the same as the earlier editions, but the contents show the results of a painstaking revision, which brings all the sections thoroughly up to date. One of the most valuable assets of the volume is the index, which has been prepared with unusual care and thoroughness.

HARRY OERTING, M.D.

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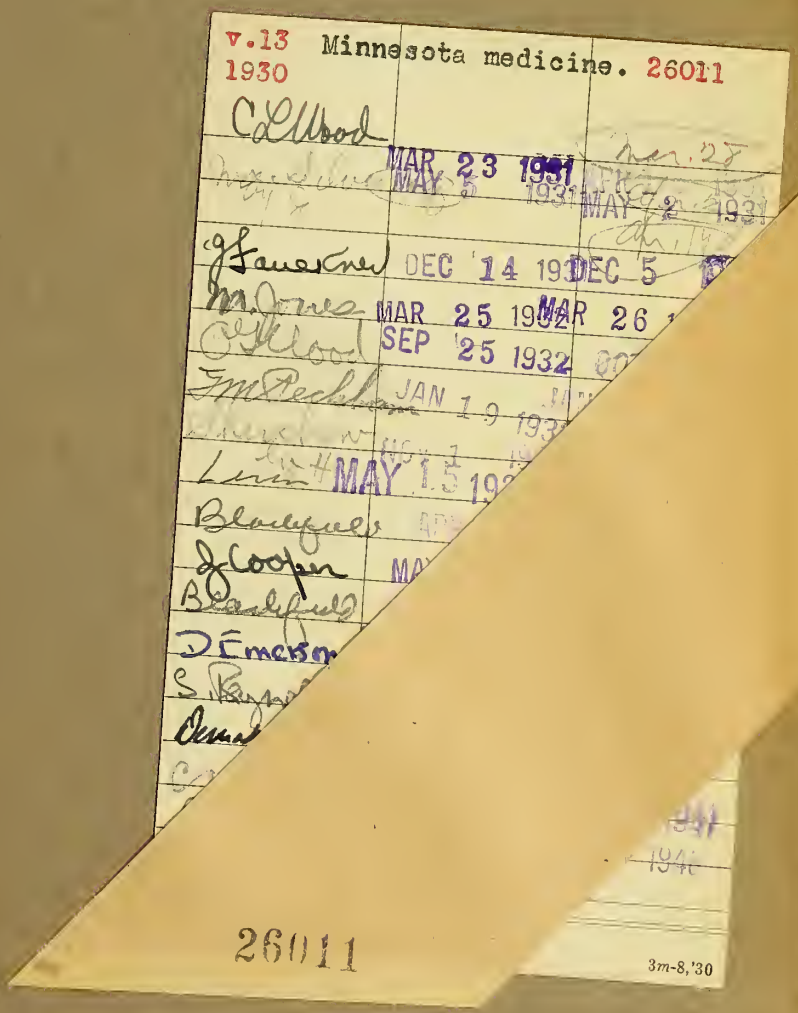
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